Equity Valuation – OdontoPrev

How much is a smile worth?

Master Thesis – Católica Lisbon

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Equity Valuation – OdontoPrev "ODPV3"

19th of October 2015

Conservative Scenario: Macroeconomic Slowdown

OdontoPrev's valuation exercise contemplates the current negative macroeconomic scenario of Brazil. As a result, the future growth assumptions are fairly conservative (i.e. sales are projected to deliver growth slightly above inflation levels). The company has improved its operational efficiency, showing a lower dental loss ratio in the last periods and has also implemented new and more reliable distribution channels with lower commission costs, therefore overcoming the challenges presented by the unfavorable circumstances of the Brazilian economy.

Smile, There is Further Possibility for Growth

After delivering growth based on the expansion of corporate members, the company has now changed its focus to SME's and individual contracts, which represent today less than 20% of the total portfolio. These segments are considered crucial for the company revenues' expansion, allowing higher margins than the corporate segment. For that, the associations with Bradesco and *Banco do Brasil* and the new distribution channels of the company arise as a key factor to succeed in this operation. None of OdontoPrev's competitors have anything close to what Bradesco and *Banco do Brasil* have to offer, so the market leader should remain with the brightest smile.

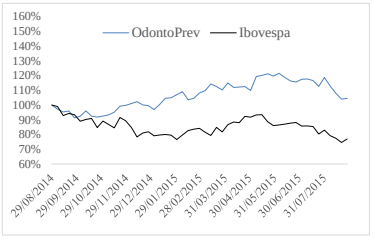
OdontoPrev's Financial Indicators Forecast

OdontoPrev Key Indicators	2014	2015	2016	2017	2018	2019	2020	2021
Average Members (thousand)	6,244	6,488	6,754	7,121	7,508	7,917	8,347	8,801
Average Ticket (R$/Live/Month)	15.43	16.64	17.44	18.20	18.95	19.73	20.52	21.35
NOR (R$ million)	**1,156**	**1,258**	**1,414**	**1,555**	**1,707**	**1,874**	**2,056**	**2,255**
NOR Growth		*9%*	*12%*	*10%*	*10%*	*10%*	*10%*	*10%*
EBIT (R$ million)	60	273	325	389	433	482	544	602
Net Income (R$ million)	**195**	**235**	**281**	**315**	**354**	**406**	**449**	**495**
Net Debt (R$ million)		-316						
PER		24						
PBV		9						

ODPV3	HOLD
Last Price (28/08/2015)	R$ 9.8
Target-Price (31/12/2015)	**R$ 10.5**
Upside Potential	6.7%
Equity Value (R$ million)	5,201
1 Month Change	(7.2%)
52w Low	R$ 8.6
52w High	R$ 11.4

Valuation	R$ Million
Enterprise Value 2015E	5,234
Net Debt 2015E	(316)
Equity Value 2015E	5,550
Shares (million)	531
Cost of Equity (Re)	11.3%
Growth Rate (g)	5%

Multiples	2015
PER	24x
PBR	8x



i. Abstract

Title: OdontoPrev – Equity Valuation
Author: Pedro Oliveira

The aim of this master thesis is to calculate the most accurate price per share of OdontoPrev (ODPV3) on the 31st of December 2015. To perform that, a review of the related literature is carried out to realize that the Discounted Cash Flow valuation model, using the Cost of Equity as a discount rate, is the most suitable method to value the company.

After discounting the free cash flows to equity, the result is a market capitalization of R$ 5,550 million, correspondent to a price per share of R$ 10.45. Besides that, the relative valuation (multiples) approach is also used to confirm the accuracy of the price per share under the discounted cash flow valuation, which displays an upside potential of 6.7% when compared with the share traded on the 28th of August 2015 – R$ 9.79.

This makes it believable that OdontoPrev is being slightly undervalued by the market, making it a good opportunity to hold the investment. A "Hold" recommendation is the result of the assumptions on the future growth prospects of the company, taking into consideration that macroeconomic events occurring in emerging markets (i.e. Brazil) may have significant impact on the valuation.

ii. Acknowedgments

This valuation exercise proved to be a perfect tool to strengthen my finance knowledge, in particular in the field of stock market and equities, while encouraging me to pursue a career in this area.

Firstly, I would like to thank Professor José Carlos Tudela Martins for the constant availability, guidance and help.

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Finally, this master thesis is dedicated to all my beloved family, friends and girlfriend, who were always very supportive and have inspired me during the last months.

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iii. Introduction

Valuation is the practice of measuring the value of an asset, being critical in investments and portfolio management. To outperform in equity markets, one should buy undervalued stocks and sell overvalued stocks, by supporting his decision on accurate estimates of its fair value. Therefore, a recommendation for the investment plan, proposing a buy, hold or sell strategy is given.

Accordingly, the aim of this master thesis is to calculate the value per share of OdontoPrev (ODPV3), on the 31st of December 2015. There is no consensus on what is the best valuation model to value the company chosen, as so, the relevant literature is initially discussed by examining different author's approaches, presented in several articles, books and journals.

There is also the need to realize what are the characteristics of the environment in which OdontoPrev operates. The company is the market leader in the dental care sector, however, the impact of factors such as the uncertainty surrounding insurance firms, regulatory settings of the sector and fierce competition has to be measured, being fundamental for the performance within the industry.

Under the DCF model – using the FCFE approach (discounted at the cost of equity) – and the multiples approach to value OdontoPrev, the outcome is a stock price believed to reflect the expectations about the future performance of the company. Moreover, a sensitivity analysis to find plausible alternative values for the price, under different scenarios, is performed.

The last step of this master thesis is a comparison between the DCF valuation done with one performed by an investment bank, Itaú BBA, where the assumptions and results are discussed.

1 Literature Review

1.1 Valuation Importance

Valuation is one of the most essential skills in Finance ever since it can reveal opportunities of investment or divestment in the entire spectrum of publicly traded companies. If one reach to a reasonable value for a company, then can take correct decisions regarding investment: According to (Buffet, 1989), “It’s far better to buy a wonderful company at a fair price than a fair company at a wonderful price”. Thus, the more accurate valuation one performs, more profitable one will be because is aware of the fair price per share.

The valuation of an asset essentially consists in predicting the future returns that a company can deliver and consequently discount the estimated future cash flows for today, using the correct discount rate. According to (Damodaran, 2002), “some assets are easier to value than others, the details of valuation vary from asset to asset, and the uncertainty associated with value estimates is different for different assets, but the core principles remain the same”.

Valuation is the assessment of the asset’s value based either on variables related to future returns or through direct comparisons with similar assets. According to (Stowe et al., 2007), “this process includes understanding the company to be valued, forecasting the company’s performance, and selecting the appropriate valuation model for a given valuation task”. Valuation is not an exact exercise, subject to the assumptions and biases of each analyst, who figures a way to calculate the value of an asset. It plays an important role in many financial operations, such as mergers and acquisitions (M&A), portfolio management and corporate finance.

According to (Stowe et al., 2007), valuation techniques can be applied in several circumstances and its main purposes are the following:

- Stock - picking. To realize which stocks are undervalued and overvalued, guiding the investor to purchase, hold, or sale the stock;
- Understanding the market. The current share prices in the market are a result of investors' expectations about the performance of variables influencing the price of the stock (e.g., earnings growth and expected return). Analysts can estimate these expectations by comparing market prices with a stock's intrinsic value;
- Estimating the value of corporate events. Market professionals use valuation techniques to analyze proposed corporate mergers & acquisitions (M&A), management buyouts (MBOs) and financial restructuring;
- Corporate governance planning. Evaluate the effects of proposed corporate strategies on the firm's stock price;
- Communication. Valuation provides a discussion between company, analysts and investors to evaluate the company's performance and future policies;
- Valuation of private owned businesses. To determine the value of firms that are not publicly traded, investors typically rely on valuations made by investment banks, which were the ones with the access to information and mandated for that purpose;
- Portfolio management. Equity valuation is the starting point for the construction of a portfolio of stocks, being a more powerful tool when used in a group context because mitigates the diversifiable risk of the market;

As described above, there are several purposes for valuing a company, however, this thesis will be focused on the first one (stock - selection), aiming to reach the price per share of the company and ultimately give the recommendation for the purchase, hold or sale of the stock.

1.2 Valuation Steps

Valuation is perceived as a complex process with several stages that should be followed in a particular way. According to (Stowe et al., 2007), "each individual valuation that an analyst undertakes can be viewed as a process with the following five steps":

- "Understanding the business". Industry and company overview, by examining firm strategies and the financial statements;
- "Forecasting company performance". Forecasted revenues and earnings are key to estimate the value of the company;
- "Selecting the appropriate valuation model". Each industry or company type has a specific valuation model that lead to a more accurate valuation, hence an overall analysis should be embraced;
- "Converting forecasts to a valuation";
- "Making the investment decision". After valuing the company, a recommendation should be given – hold, buy or sell the asset;

In the next stage of this literature review, a detailed discussion of the third step ("selecting the appropriate valuation model") will be addressed, by stressing out the main and current valuation models as well as the elements and formulas supporting them. All the approaches are relative to author's different points of view. The model that best fits the company will be chosen taking into consideration the industry sector and company structure.

1.3 Valuation Methods

There are numerous ways to value a company but being more specific and following (Damodaran, 2005), “In general terms, there are four approaches to valuation. The first, discounted cash flow valuation, relates the value of an asset to the present value of expected future cash flows on that asset. The second, liquidation and accounting valuation, is built around valuing the existing assets of a firm, with accounting estimates of value or book value often used as a starting point. The third, relative valuation, estimates the value of an asset by looking at the pricing of 'comparable' assets relative to a common variable like earnings, cash flows, book value or sales. The final approach, contingent claim valuation, uses option pricing models to measure the value of assets that share option characteristics”. There is a wide range of methods for valuing an asset, nevertheless, to choose the most relevant for the analysis, one should carefully select, apply and interpret each of them.

1.3.1 Discounted Cash Flow Approach ("DCF")

Discounted Cash Flow valuation, as implicit in the concept, is based on future cash flows to reach the firm value as of today. For that, future cash flows are discounted for today, using the right cost of capital. According to (Fernandez, 2007), the general formula for discounting cash flows is given by the following equation:

Equation 1 – Discounted Cash Flows

$$Value = \frac{CF_1}{1+r} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} \dots \frac{CF_n + RV_n}{(1+r)^n}$$

Where:

CF_i = cash flow generated by the company in the period i

RV_n = residual value (terminal value) of the company in the year n

r = appropriate discount rate

g = constant growth rate after year n

The DCF model can be computed through several ways. Following (Stowe et al., 2007), concerning cash flow, three main approaches are considered:

- Dividends (Dividend Discount Model);
- Free Cash Flow (FCFE and FCFF);
- Residual Income;

There is a fourth method with respect to DCF, the so called Adjusted Present Value (APV) which is useful to value companies where it is expected its capital structure to alternate. The purpose of APV valuation is to measure apart the effect of debt in the value of the company. In line with (Luehrman, 1997), "APV is exceptionally transparent: you get to see all the components of value in the analysis". The company being analyzed doesn't have and doesn´t intend to have debt, so this literature review will not deeply discuss the APV approach.

1.3.1.1 Dividend Discount Model ("DDM")

Dividend Discount Model is based on expected dividends, which are the expected cash flows to remunerate shareholders. This approach was developed by John Burr Williams in 1938 and assumes that the single cash flow that a shareholder has the right to receive is the dividend paid by the company. The general formula to compute the stock price is given by:

Equation 2 – Value per Share according to DDM

$$Value\ per\ share\ of\ stock = \sum_{t=1}^{t=\infty} \frac{E(DPS_t)}{(1+k_e)^t}$$

Where:

$E(DPS_t) = expected\ dividends\ per\ share\ in\ period\ t$

$k_e = R_e = cost\ of\ equity$

The stock price is the value of the expected future dividends per share, discounted at the cost of equity. In order to forecast future dividends, accurate assumptions should be made for profitability and company's dividend policy. (Stowe et al., 2007), reasons that "a discounted dividend approach is most suitable for dividend-paying stocks, where the company has a discernible dividend policy that has an understandable relationship to the company´s profitability and the investor has a control (minority ownership) perspective". This model is only dependent of one variable (expected dividends) and could lead to a gap when the payout policy is under/overestimated, so this thesis will not use the DDM approach. Gordon, in 1963, presented the Gordon Growth Model, which is given by:

Equation 3 – Gordon Growth Model

$$Value\ of\ the\ Stock_t = \frac{E(DPS_{t+1})}{k_e - g}$$

Where:

$E(DPS_{t+1}) = expected\ dividends\ in\ the\ next\ period$

$k_e = cost\ of\ equity$

$g = expected\ growth\ rate\ in\ perpetuity$

1.3.1.2 Free Cash Flow to Equity ("FCFE")

The free cash flow to the equity approach values the part of the company that belongs to shareholders, in the same line as the Dividend Discount Model but with a key adjustment observed by (Damodaran, 2009): "one way to describe a free cash flow to equity model is that it represents a model where we discount potential dividends rather than actual dividends".

Equation 4 – Equity Value

$$Equity\ Value = \sum_{t=1}^{t=\infty} \frac{FCFE_t}{(1+k_e)^t}$$

Where:

$FCFE_t = \ free\ cash\ flow\ to\ \ equity\ in\ year\ t$

$k_e = cost\ of\ equity$

To compute shareholder's equity, the free cash flow to equity is discounted at the cost of equity (k_e), representing the intrinsic risk of dividends. As stated by (Stowe et al., 2007), "free cash flow to equity is the cash flow available to the company's common equity holders after all operating expenses, interest, and principal payments have been paid and necessary investments in working and fixed capital have been made". Essentially, it is the maximum amount of cash that can be paid to the equity shareholders of the company after all expenses, reinvestment needs and debt repayment. The FCFE formula is given by:

Equation 5 – FCFE Calculation

$$\begin{aligned} FCFE = Net\ Income - Capital\ Expenditures + Depreciations \\ - Change\ in\ non\ cash\ working\ capital + New\ Debt \\ - Debt\ Repayment \end{aligned}$$

This approach starts with the net income, and then subtracts capital expenditures, since they represent a cash outflow, same as the change in non-cash working capital. Depreciations should be added because they are non-cash charges. Finally, one should add new debt, net of debt repayments. Each of the components of the FCFE formula exposed above will be explained in detail in chapter 3 – valuation.

1.3.1.3 Free Cash Flow to Firm ("FCFF")

The FCFF approach values the firm as a whole – debt and equity. Accordingly, the free cash flows to the firm are discounted at the weighted average cost of capital (WACC), which is the discount rate that takes into consideration both debt and equity weighted. FCFF is considered the cash flow available to all type of investors: equity holders and debt holders. The value of the company can be obtained as the present value of the FCFF:

Equation 6 – Firm Value

$$Firm\ Value = \sum_{t=1}^{t=\infty} \frac{FCFF_t}{(1+WACC)^t}$$

Where:

$FCFF_t = \ free\ Cash\ Flow\ to\ the\ firm\ in\ year\ t$

$WACC = weighted\ average\ cost\ of\ capital$

According to (Stowe et al., 2007), "free cash flow to the firm is the cash flow available to the company's suppliers of capital after all operating expenses (including taxes) have been paid and necessary investments in working capital (e.g., inventory) and fixed capital (e.g. equipment) have been made". The FCFF formula is given by:

Equation 7 – FCFF Calculation

$$FCFF = \ After\ tax\ operating\ income - Capital\ Expenditures + Depreciations - Change\ in\ non\ cash\ working\ capital$$

According to (Damodaran, 2009) "financial service firms are best valued when using equity methods, rather than enterprise valuation models". Since the company doesn't have debt in its capital structure, neither intends to, therefore, the DCF valuation model used in this thesis was based on the FCFE approach (described above), because it discounts future cash flows at the cost of equity, which is the only opportunity cost that the stockholders face and the only financial source of company.

1.3.2 Relative Valuation

Relative valuation approach highlights the value of a company by considering a group of comparable companies (peer group), while looking to key common variables among them. Considering (Damodaran, 2005), "a potential investor in a stock tries to estimate its value by looking at the market pricing of "similar" stocks". Agreeing with (Frykman & Tolleryd, 2003), in order to compute a relative valuation multiple one should follow this steps:

- Identification of a key variable to value the company;
- Choose comparable companies;
- Adjust for differences between companies;
- Calculate multiples of the peer group;
- Apply multiples to the chosen company to estimate enterprise value/equity;

The valuation with multiples is computed with ratios that express the firm value in relation to particular variables such as net operating revenue, earnings or book value. By multiplying the average ratio of the peer group with the variable chosen, one obtains the firm value. Multiples offers several advantages to the valuation analysis for the reason that they are easy to calculate and give another valuation perspective – external one (peers). Consequently, one must identify which multiple is more appropriate to value each company, according to industry sector and company structure, and also take precaution on how to compute it correctly. There is one important aspect relatively to which type of multiples should be used to value each company, it is empirically verified by (Liu, 2001) that, "the dispersion of pricing errors increases substantially for multiples based on historical drivers, such as earnings and cash flows, and is especially large for sales multiples".

Choosing the appropriate group of comparable companies – peer group – is one of the most challenging tasks in relative valuation, distinguishing high-level analysts from common ones. The fact that a company is in the same industry is not sufficient condition for belonging to the peer group since it's reasonable for companies in the same industry to have completely different growth patterns, capital structure and risk. This fact is easily explained by the discrepancy of stock's performance within an industry. According to (Damodaran, 2002), the peer group members should be similar to the company being valued, namely in cash flows, growth potential and risk Accordingly, (Goedhart, 2005) recommends to be considered as peers, companies with comparable projections of return on invested capital and growth rate.

Multiples are divided in two groups: enterprise multiples, which reflect the enterprise value ("EV") of a company, and equity multiples, which express the market capitalization of a company. Examples of enterprise multiples include EV / EBITDA, EV / EBIT and EV / SALES, among others. Concerning, equity multiples, the most commonly used are the Price / Earnings ratio ("PER") and Price-to-Book value ("PBV").

Taking into consideration that the company doesn´t hold debt in its capital structure, enterprise multiples will lead to less precise estimates since the comparable companies have totally different capital structures – most of them use debt. Besides that, and in line with (Damodaran, 2009), "the cash flows to a financial service firm cannot be easily estimated, since items like capital expenditures, working capital and debt are not clearly defined", as so, enterprise value multiples cannot be easily adapted to financial services firms. Consequently, equity multiples will better forecast the value of the company and the most commonly used are price earnings ratio ("PER") and price to book value ratios ("PBV"). Also due to the fact that this valuation will be based on the FCFE, it seems a more coherent strategy to emphasize equity multiples as a complement to the DCF valuation. Price multiples offers several benefits: it's simple and easy to implement, uses market information directly and it values a company relative to comparable assets. Price to book value ratio measures the equity market value (MV) of an asset in relation to its book value (BV). It is commonly used to value financial services firms such as banks and insurance companies. Price earnings multiple measures the current share price relatively to earnings (net income).

Equation 8 – PBV

$$\frac{P_{Market\ Value}}{P_{Book\ Value}}$$

Equation 9 – PER

$$\frac{P_{Market\ Value}}{Earnings\ per\ Share}$$

1.4 Explanation of the Model's Variables

1.4.1 Capital Asset Pricing Model ("CAPM")

The CAPM approach was developed in 1970 by William Sharp. The author identified two distinct types of risk when calculating the expected return of a stock:

- Systematic risk – related with the interest rates of the country of activity and other events that could impact the country's market as a whole. This risk cannot be diversified anyway since it is intrinsic to the economy.
- Specific risk – can be diversified when the investor owns a portfolio of stocks. This type of risk is not correlated with general market variations.

In order to calculate the expected returns of an asset, in this particular case, the cost of equity (R_e), one should use CAPM since it is the most widely used method among academics and analysts. The expected return of an asset equals the rate of a risk free security plus a risk premium shown below:

Equation 10 – CAPM - R_e

$$R_e = R_f + \beta_e * (R_m - R_f)$$

Where:

$R_f = rate\ of\ an\ investment\ with\ zero\ risk$

$R_m - R_f = equity\ risk\ premium$

$\beta_e = measure\ of\ the\ risk\ of\ company'\ equity$

It is important to stress that one should not invest in the occasion that the expected return of an asset doesn´t meet the required rate of return. All the variables for computing the return of a stock will be individually explained below, aiming to comprehend the multiple drivers of one of the most important assumption of this valuation – cost of equity (R_e).

1.4.2 Risk Free

As pointed out by (Damodaran, 2008), "we define risk in statistical terms to be the variance in actual returns around an expected return. The greater this variance, the more risky an investment is perceived to be". So, for an investment to be risk free, the actual returns should always be equal to the expected return. The risk free ("R_f") rate is defined as the rate of an investment with no risk, which implies that, when no variance around the expected return is reported, one should consider the investment as risk free, meaning that the investment will deliver the same return, regardless of the scenario at hand. There is an intrinsic requirement for an investment to be can considered risk free, which concerns its default risk[1]. As such, the securities that may be considered as risk free are government bonds[2] due to the fact that the governments control the country's monetary policy and currency issuing. For the valuation purposes, this thesis will use the risk free rate of a US ten-year treasury bond traded on the 28th of August 2015 – 2.2%.

1.4.3 Equity Risk Premium

The equity risk premium (ERP) reflects the incremental premium required by an investor above the risk free asset and so is defined as the spread between the historical return of a portfolio of stocks (market returns), usually representative of the market portfolio, over the historical returns of government bonds. There is a lot of debate on how to calculate the equity risk premium – historical ERP, as explained above, or alternative ERP regressions based on dividend returns. According to (Damodaran, 2002), the historical ERP is the most commonly used method and accordingly to his data, ERP is 5.75% for a mature market such as the S&P 500.

1.4.4 Country Risk Premium

The calculation of the company's cost of equity is based on US figures, so in order to reflect the additional risk present in emerging markets one should incorporate a country risk premium in the discount rate (cost of equity). The country risk premium for Brazil was obtained in Damodaran's data sets – estimated as 2.9%.

[1] When companies or individuals aren't able to make the required payments of their debt.

[2] Debt issued by a country's government.

1.4.5 Beta

Beta ("β") is a company's measure of risk, being estimated by regressing stock returns (ODPV3) against the market returns (IBOV), in order to observe how close the company stock and the market move together. This examination is undertaken as the formula suggests:

Equation 11 – Beta Calculation

$$Beta = \frac{Cov(R_s, R_m)}{Var(R_m)}$$

Where:

$R_s = company\ stock\ returns$

$R_m = stock\ market\ returns$

The company's beta estimation contemplated different time spans and has shown significant changeability when calculated on a daily, weekly and monthly basis (see **Appendix 2**). The beta chosen for the valuation is estimated with data from 28th of August 2010 to 28th of August 2015 on a weekly basis, leading to a value of 0.44. This estimation is weekly based because it is the intermediate time between the three time spans and also showed a more representative value, comparatively with the other analysis. A beta below 1 indicate that the stock price will be less volatile than market. In contrast, a beta above 1 represents an investment pattern more volatile than the market.

1.4.6 Cost of Equity

Cost of equity ("R_e") represents the rate of return of a shareholder's investment. There are numerous ways to compute the cost of equity: CAPM, Fama-French three-factor model and Arbitrage Pricing Theory model ("APT").

The CAPM approach is the most widely used method to compute the cost of equity. Nevertheless, the method has been under some criticism during the last years, since Fama-French pointed out that differences in betas from 1963 to 1990 did not explain different stock performances. Even though CAPM is being criticized by the investment community, it's still the most used and studied method. Thus, to estimate the cost of equity of the company, this thesis will address the CAPM approach, but with some increments, such as inflation differential and country risk premium.

1.4.7 Cost of Debt

Cost of debt ("Rd") is the current rate that a company pays to use debt financing. Cost of debt it is normally computed after taxes since the interest payments represent are tax-deductibles. The financing cost gives investors an indication of the risk of a company, since the riskier companies are, the higher will be its cost of debt. The company doesn't have debt in its capital structure so this topic will not be further discussed.

1.4.8 Weighted Average Cost of Capital

The weighted average cost of capital ("WACC") is the calculation of a firm's rate of return, taking into consideration the weight of each source of capital (equity and debt) in the firm's value, multiplying each by the cost of each source of financing. As stated by (Damodaran, 2007), "cost of capital is the cost of all capital invested in an enterprise", thus calculating the cost of capital of a company with WACC, when the company holds different sources of financing, seems to be the most coherent approach. There is also the fact that WACC considers the adjustment for tax purposes (interest tax shield[3]), due to the use of debt and payment of interest expenses, by deducting its absolute value. The WACC is calculated according to the formula below:

Equation 12 – WACC Calculation

$$WACC = \frac{D}{V} * (1 - t) * R_d + \frac{E}{V} * R_e$$

Where:

$D = market\ value\ of\ the\ firm's\ debt$

$E = market\ value\ of\ the\ firm's\ equity$

$V = D + E = total\ market\ value\ of\ the\ firm's\ financing$

$t = tax\ rate$

This valuation will not calculate the WACC of the company due to the inexistence of debt in the capital structure, thus, the cost of capital used as a discount rate will be the cost of equity.

[3] The reduction in income taxes which results from the tax-deductibility of interest payments.

1.4.9 Terminal Value

An imperative issue regarding the DCF analysis is the unbounded life of firms. The DCF equation have two distinct elements in the numerator: the free cash flow forecasts and the terminal value. This differentiation is made due to the fact that cash flows cannot be accurately estimated forever. For sake of simplicity, DCF users assume that after several years of cash flow forecasts (terminal year), cash flows will grow forever (terminal value) at a constant rate. According to (Young et al., 1999), the calculation and use of the terminal value is the most consistent way to deal with the uncertainty of the company's future performance – expressing the upcoming with a perpetuity formula. The terminal value represents a very important portion of the valuation since it accounts for 77% of the equity value estimated.

1.4.10 Growth Rate

Growth rate ("g") is the rate assumed, in the perpetuity, for the terminal year of the valuation - year after the explicit period. For the growth rate estimation one should take into consideration that growth must not exceed the growth of the economy where the firm operates and dividend growth must increase at the same rate of other performance measures (Damodaran, 2002).

In a general way, g is calculated as a product between the retention rate ("RR") and the return on equity ("ROE") as shown below:

Equation 13 – Growth Rate Calculation

$$g = RR * ROE$$

Where,

$RR = the\ percentage\ of\ net\ income\ retained\ by\ a\ company\ to\ finance\ its\ growth$

$ROE = net\ income\ divided\ by\ the\ shareholder's\ equity$

The company has been distributing 100% of its net income in the last years, only retaining an amount for legal reserve purposes – 5% of the net income until 20% of capital value is reached. Post that, the growth rate will not be calculated with the formula shown above, thenceforth will be assumed a growth rate equal to the inflation estimations for the terminal year (4.5%) plus 0.5% premium, reflecting a g of 5%.

1.4.11 Inflation

Inflation is the rate at which the level of prices for goods and services increases, as a result, the currency purchasing power is reduced. Generally, in order to keep the economy running efficiently, central banks restrict inflation and try to avoid deflation[4]. Inflation is considered one of the main reasons for people investing, because the value of money varies in time - time value of money[5].

From 1980 to 1994, Brazil suffered periods of hyperinflation due to the massive volumes of money creation undertaken by the central bank, aiming development projects. Nowadays, Brazil is showing high inflation levels (8%) but not compared with those of the last decades – fourteen-year period of three to four-digit annual inflation rates.

For the purpose of this valuation, the items of the financial statements will be projected in nominal terms, meaning that inflation effects will be taken into consideration. The source used to provide the inflation estimates was the IMF databases – inflation projections, data from March 15th, 2015.

Inflation Differential

In order to adjust the cost of capital for inflation differences among U.S. and Brazil, one should calculate the spread between Brazilian and U.S. inflation rates. The inflation differential in 2015 is exceptionally high when compared with future projections so, with the purpose of not biasing the cost of equity and the DCF valuation, merely based on 2015 figures, an average during a larger period (2015 to 2018) is made, giving a value of 4%.

Table 1 - Inflation Differential between Brazil and United States (U.S.)

Country	Subject Descriptor	2015	2016	2017	2018	2019	2020	2021
Brazil	Inflation rate, end of period	*8%*	*5%*	*5%*	*5%*	*5%*	*4%*	*4%*
U.S.A	Inflation rate, end of period	*1%*	*2%*	*3%*	*2%*	*2%*	*2%*	*2%*
BR – U.S.	Differential Inflation rate (BR – U.S.)	*7%*	*3%*	*2%*	*2%*	*2%*	*2%*	*2%*
	Average Differential Inflation (2015 - 2018)	*4%*						

Source: IMF and own calculations

[4] Decrease in the price level of goods and services (inflation rate below 0%).

[5] The money available today is worth more than the same amount in the future due to its earning capacity.

1.5 Valuation in emerging markets

More than ever, capital movements between countries are becoming more liberalized, in a way that companies easily shift their investments from developed countries to emerging markets (i.e. Latin America and Asia), pursuing expansion of activities and risk diversification. Investing in emerging markets provide attractive returns when compared with mature markets, but in contrast, expose an investor or a company to additional risk, i.e. high inflation levels, macroeconomic volatility, political changes, war, corruption, regulatory changes and the lack of accounting control. The cross border investment increase has obligated academics and analysts to review the assumptions on the foundations of value (risk parameters, debt ratios and growth rates), which is forcing one to apply dynamic valuation models instead of the static ones – used in mature markets.

As explained by (Goedhart et al., 2010), there are two ways to deal with the uncertainty in emerging markets: develop DCF scenarios or increment a country risk premium to the cost of capital.

The first approach develops two different scenarios for future cash flows weighted at a certain probability: The positive scenario where the assumptions reflects business growth as it is expected, on the other hand, a negative scenario need to be valued, in order to match with the risks associated with emerging markets.

The second technique adds a country risk premium to the cost of capital of the company, which will negatively affect the share price valuation since it increases the denominator in the present value calculation, thus reflecting the risks associated with emerging markets.

This thesis addressed the second approach, adding a country risk premium, being the construction of scenarios considered not plausible for the valuation, as a consequence of the sustainable business model of the company and industry type (described in chapter 2). Therefore, adding a country risk premium to the calculation of the cost of equity will reflect the potential risks over the economy that can impact the company in the long run.

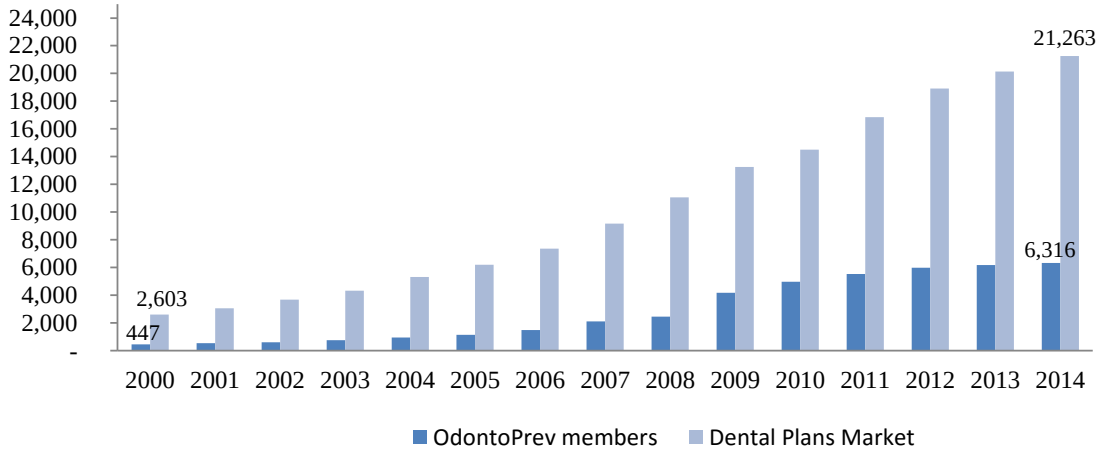
2 Market and Company Overview

2.1 Market Overview

In order to perform an accurate valuation of OdontoPrev, it´s crucial to analyze the environment in which the company operates, with special attention to industry growth drivers and risk factors of the sector.

According to ANS[6], in 2014, 50.8 million Brazilians were members of private healthcare plans and 21.3 million were members of dental plan benefits - 10% of the Brazilian population[7]. The dental plans market grew from 2.6 million members, in 2000, to 21.3 million in 2014, corresponding to a CAGR of 16.2%. In the same period, OdontoPrev achieved a CAGR of 20.8%, growing from 450 thousand to 6.3 million members. In 2000, the company had 17% market share and nowadays has 30% (see **Appendix 3**). A significant portion of the dental market is concentrated in corporate plans (as a benefit from companies to employees) which is a very reliable source of new members, nevertheless highly dependent on job creation.

Exhibit 1 – Evolution of OdontoPrev Members vs. Dental Plans Market



Source: OdontoPrev and ANS.

[6] ANS is the regulator of the healthcare industry.

[7] According to IMF, Brazilian population is estimated in 203 million in 2014.

Keeping into view the Brazilian population and the percentage of the country's population that owns a dental plan (11%), it is expected that dental sector continue to grow at least at the same pace of the last years.

Brazil has one of the highest dentists supply in the world[8], being registered 268 thousand professionals, equivalent to a dentist to member ratio of 1:764 comparatively with U.S. - 160 thousand professionals for a population of 320 million, which presents a ratio of 1:2000. While comparing these two countries and having in mind that the U.S. is a developed country it's noticeable that Brazil has an excess surplus of dentist professionals. Even though the existence of numerous professionals in the sector, there is a huge gap between supply and demand for this service, since only 11% of the population has access to dental care. This occurred due to the lack of efficient companies providing the service, resulting in higher prices – not affordable for the population in general. As opposed to the healthcare industry, where individuals have the government healthcare system, the dental care was only fulfilled by dentists, without the support of a management team and financial partner, being extremely unaffordable for the population. This business model was directed to the segment of the population who could afford higher prices and prompt payment. This fact allowed for the provision of highly technical and scientifically advanced dental care procedures using refined and exclusive resources.

The lack of access to dental care created an opportunity for dental plan companies to penetrate the market, supported with capital and management know-how. As a result, after the second half of the 1990s, the dental plan sector grew consistently due to several factors:

- Structural disparity between the supply and demand of the service;
- Lack of public service alternative;
- Inclusion of dental plans in corporation's benefits for the employee;
- Interest from new distribution channels;
- Reforms made by the regulator of the sector (ANS);

[8] Source: Conselho Federal de Odontologia – Brasil, Julho 2015.

2.2 Risk Factors

There are two types of risk factors to be pointed out: risks related to Brazil (macroeconomic events) and risks related to the dental plan sector. While analyzing an emerging market, it's important to be aware of all macroeconomic and political risks that could harm the company. The Brazilian government exercises significant influence over the economy and so, there are several variables that could negatively affect the company:

- Unemployment
- Inflation
- Fluctuation of interest rates
- Volatility in the exchange rate (mostly, BRL - USD)

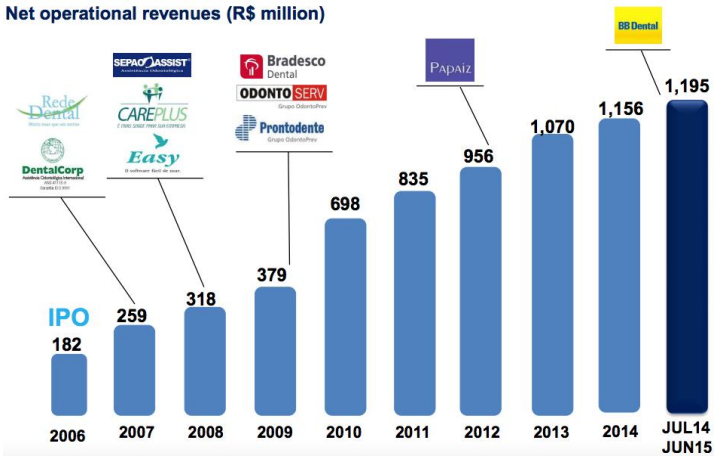
Those negative variables can impact catastrophically the Brazilian economy in a sense that they can restrict the production of the country (GDP), raise the prices of goods and services at an internal and external level, leading to a reduction in the OdontoPrev's dental plan sale and ultimately impact the company in the stock market. Dental care companies operate in the insurance business and in order to be profitable, have to accurately estimate and control costs: the company increases monthly fees to offset future cost increases. Companies have been reducing its dependence on external brokers, since they work without exclusivity and have an excessive bargaining power. Companies must undergo new distribution channels, such as bancassurance[9], direct sales and online sales to create a better dynamic of customer addition, leading to a better quality of sales, with lower commissioning and higher margins. The dental care industry could be adversely affected by new government regulation and also in the case where government decides to establish a subsided dental care system itself. Nevertheless, the risk pattern of dental care is different from medical care. Medical care costs increase with the aging of the population and with the introduction of new and costlier equipment. Inversely related, dental care costs are higher in the beginning of the contract period, since dental treatments had never been made but after this initial peak, the cost per member decreases until it reaches a maintenance level that tends to remain stable, independently of the member's age (see **Appendix 4**).

[9] Bancassurance is a financial agreement between a bank and an insurance company, allowing the insurance company to sell its products to the bank's client base.

2.3 Company Background

OdontoPrev was established in 1987, when a group of dentists identified an opportunity in providing dental care for corporate clients. In August 1998, a Private Equity firm acquired control of OdontoPrev, highly contributing to the strategic leadership positioning of the company, current market leader in the sector and responsible for the development of new innovative corporate governance practices in the Healthcare sector. In December 2006, the company went public through an Initial Public Offering (IPO), raising 171,411 BRL net of placement expenses. Overall, 18,643,973 shares were sold at 28 BRL per share, totalling 522 million BRL - at this time the free float of the company was 84.2%. The IPO and the companies that OdontoPrev bought contributed to a member increase of 1.5 million (2006) to 6.2 million (2013). After the IPO, OdontoPrev bought several companies (inorganic growth[10]), mainly small competitors and other companies that presented high potential of synergy, generating competitive advantages, i.e. Easy, a supplier of medical software provided a helpful monitoring system that assess the quality of the service provided and mitigates fraudulent activity on the dentist and customer side, resulting in a lower DLR[11].

Exhibit 2 – Evolution of the Net Operating Revenue and Companies Bought since the IPO



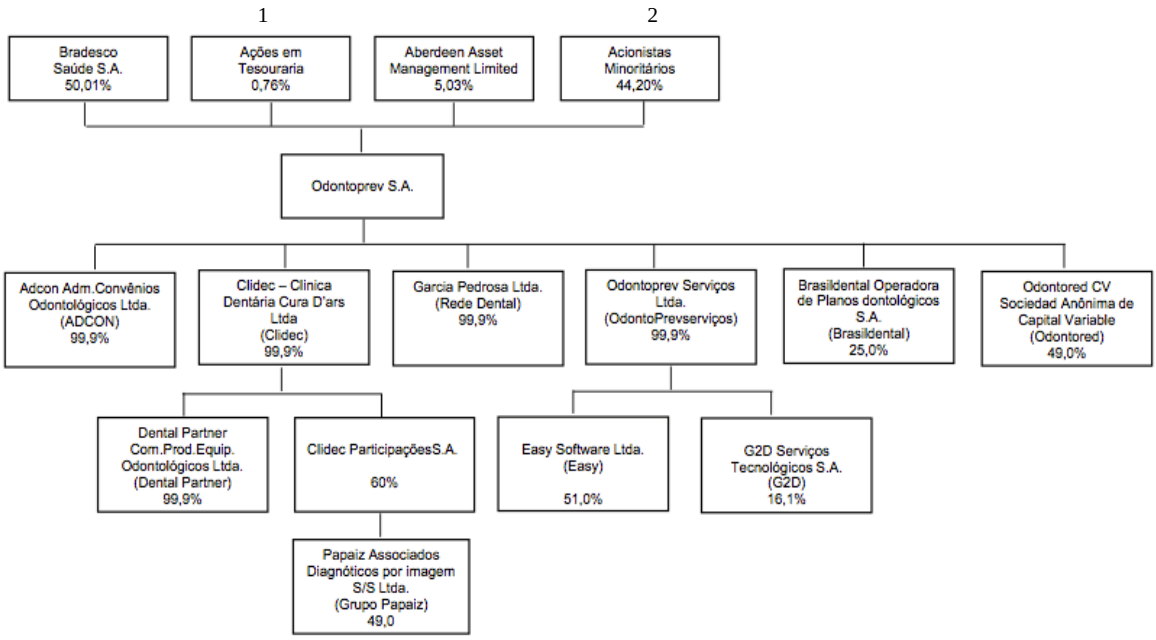
Source: OdontoPrev Corporate Presentation September 2015.

[10] A growth in the operations of a business, due to mergers or takeovers, rather than an increase in the company's own business activity.

[11] Dental loss ratio (DLR) is the ratio of total losses incurred in claims divided by the total premiums earned.

In October 2009, OdontoPrev celebrated an agreement with Bradesco Dental S.A to merge the activities of both companies and two months later OdontoPrev was a fully integrated subsidiary of Bradesco S.A (see company structure below):

Exhibit 3 – Company Structure: Owners and Subsidiaries



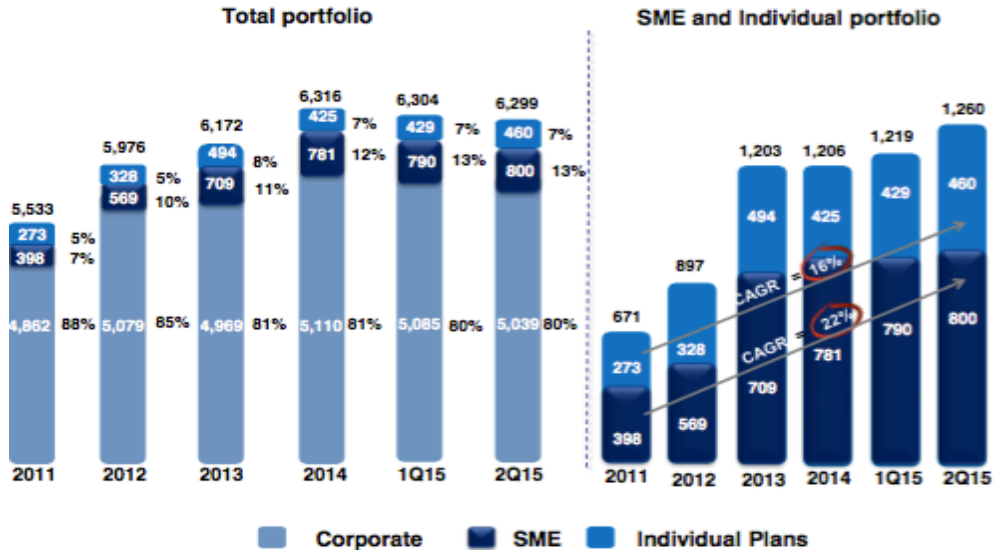
Source: OdontoPrev; 1 – Company Shares; 2 – Minority Shareholders

In June 2013, OdontoPrev signed a contract with *Banco do Brasil Seguros Participações S.A* for an Association through a separate vehicle - *Brasildental Operadora de Planos Odontológicos S.A,* with the objective of distribute and commercialize dental plans, exclusively under the channel and brand name of *Banco do Brasil,* during 20 years, with the option of renewal for the same period. This association will allow OdontoPrev to better reach SME's and individual contracts, which are the operating segments that the company as lack of access. *Banco do Brasil* has 60 million clients and those are different target clients while comparing with Bradesco.

2.4 Company Analysis

OdontoPrev is a dental care operator that provides dental benefit plans for three main segments: corporate, small and medium enterprises ("SME") and individuals. In compensation for the dental service provided, the company charges a monthly fee, depending on the coverage of the plan. In December 2014, the company had 6.3 million clients, from which 5.1 million were corporate clients; 800 thousand SME contracts and 400 thousand were individuals. The member's portfolio of the company divided by segment is exhibited below.

Exhibit 4 - Evolution of Members by Segment



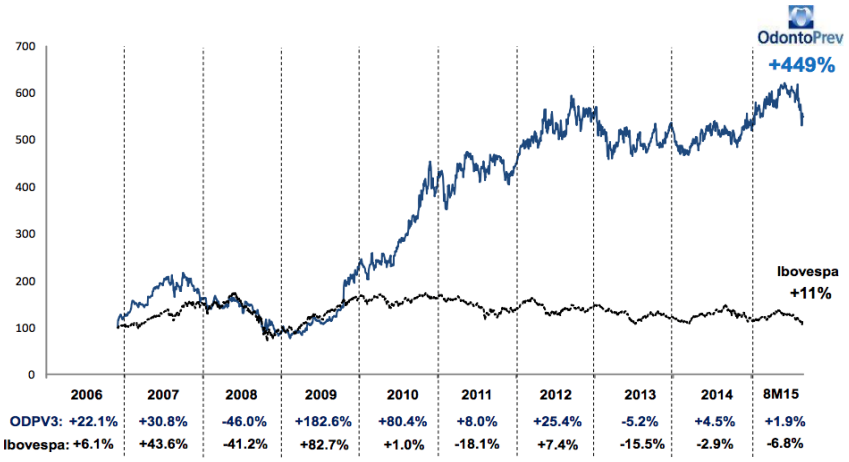
Source: OdontoPrev Corporate Presentation of September 2015

OdontoPrev is the market leader of the dental care sector in Latin America, where its clients enjoy differentiated health solutions provided by an extremely specialized network of 25,000 dentists. OdontoPrev operate two distinct types of plans: pre-paid plans and post-paid plans. In the first and most chosen payment modality, the type of coverage and the monthly payment are previously defined. The customer receives the dental care service covered by the plan chosen through the accredited network, without any additional disbursement. In the second model, the customer chooses the surgeon and the clinic where wants to be treated, but has to pay directly to the dentist and subsequently ask for the reimbursement, under the limits of the contract. OdontoPrev also provide some treatments in company-owned units.

2.5 Company's Stock Performance

OdontoPrev is listed in the BM&FBovespa[12] (Ticker: ODPV3), being a component of Brazil IbrX 100 index, which is designed to measure average stock performance of the 100 most traded stocks of the Brazilian stock market. The company is part of the most demanding listing segment in Brazil (also called Novo Mercado), founded in 2000, aiming companies to voluntarily assume corporate governance levels above the requirements. For instance, the minimum requirement for Dividend Pay-out Ratio ("DPR") is 25%, meanwhile OdontoPrev distributes 100% of the net income to shareholders. The company's free float represents 47.6% of total shares, dispersed in 33 countries, 50.01% belongs to Bradesco, the controlling shareholder, and the remaining amount is treasury (see **Appendix 5**). Bradesco is the second largest private bank in Brazil and is considered a strong partner of OdontoPrev since the bank has a large amount of clients (more than 80 million) and a strong reputation with them. The company had been constantly beating the Bovespa index since 2009 and the total shareholder remuneration in 2014 was 4.5%, represented by a share variation of 0.3% and 4.2% in dividends and interest on capital.

Exhibit 5 - Total Shareholder Remuneration since 2006



Source: OdontoPrev Corporate Presentation September 2015.

[12] Sao Paulo stock exchange, former Bovespa (founded in 1890), has merged with the Brazil Mercantile and Futures Exchange in 2008, creating BM&F Bovespa.

2.6 Company Strategy

The strategy of OdontoPrev is to lead the consolidation of the healthcare sector in Brazil, by providing dental care treatment to the population at a fair price, or as stated in their mission: "To become a major link between society and dentistry, adding value to this relationship by providing excellent services to both".

The mission of the company will be achieved through the efforts of an experienced and specialized management team, who have a deep understanding of the Brazilian dental care market, by maximizing the quality and reliability of the service given. OdontoPrev is constantly seeking economies of scale to improve cost efficiency, placing though the product at a fair price.

There are multiple growth vectors that allow this strategy to happen:

- Inertial growth: the expansion of corporate clients' workforce represents a chance to growth, since a higher number of members will be reached without cost of capture;
- Organic growth: capturing new clients with the effort of sales and marketing teams;
- Inorganic growth: by acquiring companies seeking potential synergies whereas could increase growth and generate higher results;
- Commercial partnerships and new distribution channels: strategic partnerships such as bancassurance is the optimal way to access unexplored markets with lower penetration, providing higher growth potential, namely SME's and individuals;

Those growth vectors are consistent with the distribution channels used by the company, allowing for the provision of an efficient and diversified distribution channel network:

- Internal sales team;
- Online sale;
- Independent brokers;
- Cross sale with medical plans (through partnerships with other operators);
- Bancassurance (Bradesco & *Banco do Brasil*);

2.7 Competitive Advantages

The dental service provided by OdontoPrev is recognized for its reliability by more than 6,000 Brazilian and multinational corporate clients, such as *Ambev, Globo*, MacDonald's and Coca Cola. The diversity of services offered, carefully segmented for each group of clients plus the multiple and strategic distribution channels enable the company to grow sustainably. Besides that, OdontoPrev is proprietary of an IT platform, allowing the company to:

- Manage the logistics and relations with dentists;
- Monitor the performance of each dentist;
- Monitor the oral health of their associates and their relations with the company;
- Adopt a pro-active approach for managing the clinical and behavioural risk of dentists and members;
- Monitor the quality of the services provided;

The IT platform owned by the company has proven to be a good competitive advantage, resulting in a significant decrease in the cost of services, by reducing the service claims while increasing the quality of the service provided due to the higher monitoring and control of the dentist's skills and member's claims.

The management team have demonstrated a deep knowledge of the market. Most of the managers are dental plan specialists, with expertise in the dental sector for decades, having the awareness to design the product to fit different client's needs. Concluding, actions taken in the past and measures implemented recently, alongside with the multiple competitive advantages presents OdontoPrev as an undisputed market leader with lot of potential for further growth.

2.8 Competitor Analysis

The dental care sector in Brazil is highly fragmented, facing significant rivalry from new and existing competitors. In the last 3 years, companies engaged in an irrational fierce competition fighting for the same client, pushing towards a price war scenario. According to an Industry Outlook for 2015, done by *Votorantim corretora*[13]*: "*In 2012, the difference between the average maximum and minimum prices was R$ 6.90. In June 2014, this gap narrowed to R$ 3.60, showing a more competitive environment among the main players". The war on prices ended last year due to the unaffordable costs that companies had to bear, as a consequence of that strategy.

As mentioned before, 21.3 million Brazilians own a dental plan and OdontoPrev assists 6.3 million, representing 30% of the market. One crucial fact that explains the leadership position of the company is the degree of specialization in the dental care sector, comparatively to its peers, which are mainly healthcare operators – cross-selling healthcare plans with dental plans. Thus, the company provides a differentiated service and operates throughout the entire Brazilian territory.

The company operates in a competitive market where companies offer dental care plans with comparable benefits, such as healthcare companies, insurance companies and hospitals. The sector has 1,425 dental care active providers and according to ANS, the dental plan sector is going through a period of consolidation[14]. Most of the companies operating in the dental plan sector are specialized in medical care but also sell dental plans (cross selling), i.e. Amil, which was bought by UnitedHealthcare[15], has 10% of the market share. Amil is the biggest Brazilian company in the healthcare sector, specialized in all type of medical services, dental benefits included. Other significant players are: InterOdonto (5%), SulAmérica, MetLife and Caixa all with 3% each *(*see **Appendix 6**).

[13] Votorantim Corretora is a Brazilian Investment bank acting mostly as a brokerage firm.

[14] A stage in the life of an industry in which its components start merging to form fewer components.

[15] UnitedHealthcare is one of the biggest medical insurance companies across the US and internationally.

3 Valuation

In this chapter, assumptions and forecasts that ultimately lead to the estimated value per share will be presented. Each variable of the income statement will be defined, analyzed and projected for future periods (explicit period[16] and terminal value), the same will be done to the cost of capital and the determinants of its calculation. All the assumptions are estimates of the IMF database projections and own analysis of company historical performance. Furthermore, as introduced previously, two methods were used to value the company on the 31st of December 2015: The DCF Model and the Relative Valuation approach.

[16] The time span considered for the valuation (2016 -2021)

3.1 Net Operating Revenue

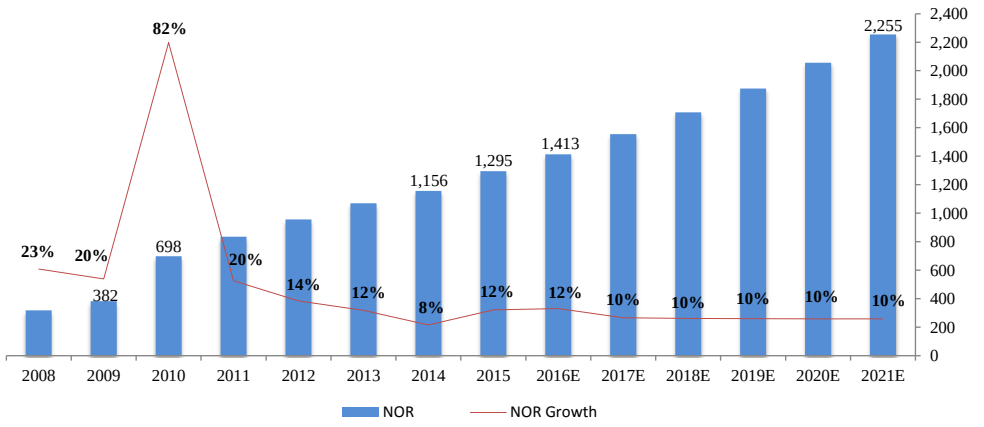
The company valuation strongly depends on the revenues forecast, since the vast majority of the items in the income statement are projected as a percentage of net operating revenue. According to (Stowe et al., 2007), a top-down forecasting approach should be followed, starting with international and national macroeconomic forecasts to reach industry and asset forecast, in contrast with the bottom-up forecasting approach, which is based on asset forecasts rather than macroeconomic environment – subject to inconsistent problems, such as different inflation assumptions undertaken by different analysts.

OdontoPrev offers dental plan benefits to three different segments (corporate, SME's and individuals), each of them with different growth standards and pricing strategies – considered relevant to forecast revenues for the explicit period. Since the company only started to disclose their revenues by type of segment in the first quarter of 2015 and yet has not provided any historical background, this Thesis will not display the breakdown of revenues by segment. Hence, the revenues estimation was addressed using global values, in mind revenues historical growth.

To better understand the growth drivers of sales, a breakdown between average ticket and average members is made: average ticket refers to the price that members pay per month (R$/Live/Month) and average members stand for the amount of contracts that a company owns within one year, on average. For the average ticket - as a pricing strategy of the company - a growth rate marginally beyond inflation is assumed, as mentioned in the conference call of the company in first quarter of 2015. Thus, based on IMF inflation estimates and historical pricing policy of the company, an average ticket growth weighted at 90% of the estimated inflation is assumed, revealing a 4% ticket growth per year. The average members forecast is based on the historical average growth between 2012 and 2015 - a period where sales showed a consistent and constant growth (see **Appendix 7**).

After estimating the average members and average ticket, a forecast of the NOR for the explicit period is the final outcome, reaching to R$ 2.25 billion in 2021, as exhibited below:

Exhibit 6 – Historical and Forecasted NOR, in Value (R$ million) and Percentage (%)

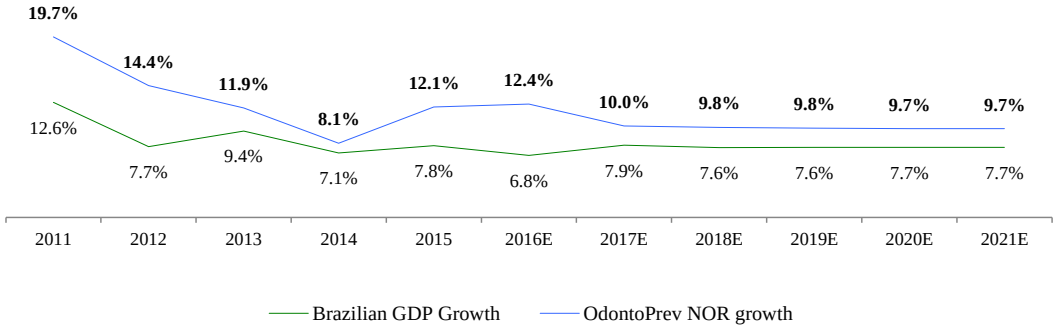


Source: OdontoPrev and own calculations

The average ticket for 2015 is calculated taking into consideration the average ticket reported in the 1st half of 2015, 16.64 BRL, which is assumed to remain the same value for the 2nd half of the year. Average members in 2015 are estimated to grow 3% over 2014.

The combined effect of the revenue drivers (average ticket and average members) results in a growth rate of 10% of the net operating revenue (NOR) during the explicit period – except for 2015 and 2016 which is 12%, as shown in the figure below:

Exhibit 7 – Historical and Forecasted NOR growth (%) vs. Brazilian GDP (%), at current prices



Source: IMF data, OdontoPrev and own calculations

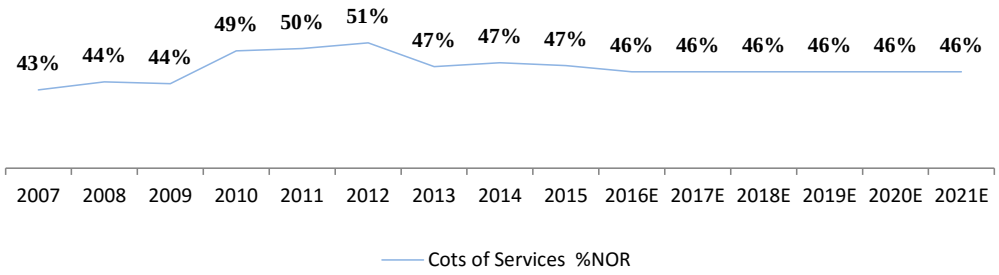
3.2 Cost of Services

This thesis calculated the cost of services as a percentage of NOR, taking into consideration the top-down forecasting approach and following (Goedhart et al., 2010), who recommends operating expenses, such as cost of services, selling and administrative expenses and other operating expenses to be forecasted as a percentage of net operating revenue. Cost of services is the cost of providing the treatment to the clients of the company and it's composed by:

- Healthcare claims (87% of cost of services) – represents the amount paid to the network of dentists for treatment purposes. In the past years, this item has shown variability in the amount of claims. The company closely monitors its contracts to mitigate future risks and currently considers that a claim ratio of up to 60% permits a margin that supports the company's administrative expenses;
- Payroll charges on services (6% of cost of services) – social security charges on the account of the employee. Since 2010, the company is facing a judicial process claiming allegedly unpaid extraordinary expenses. OdontoPrev is holding the position that the network of dental practitioners' social security taxation is not imputable to the company, but rather to the dental offices, since OdontoPrev simply aims to act as an intermediate;
- Dental materials (1% of cost of services) – provided to the network of dental clinics to ensure the maximum quality of the treatment;
- Other expenses (6% of cost of services) – composed by IBNR and other expenses. IBNR stands for incurred but not reported claims reserve. This item refers to claims that were accounted later than the period of occurrence, due to a certain circumstance.

Cost of services represent the percentage of NOR that turns into cost for the company and the major growth driver of this item is the healthcare claims. Cost of services is estimated as a whole, in a simplistic way, since the other components did not represent a significant weight in this item, as so, they were not projected for the explicit period. In the last 8 years, cost of services had fluctuated between 43% and 51%, as a percentage of NOR.

Exhibit 8 – Historical and Forecasted Cost of Services as a % of NOR



Source: OdontoPrev and own calculations.

Cost of services represented 47% of NOR in the first half of 2015, which is in line in the last two years, thus it's assumed that figure for 2015. Moreover, for the explicit period, cost of services is projected to represent 46% of NOR, displaying a reduction in the DLR, as result of the management team's effort to mitigate the fraud and improve the quality of the service given (see **Appendix 8**). This assumption is also supported by the rational stability of the dental care need in the oldest members of the company's portfolio.

3.3 Selling Expenses

Selling Expenses comprise the amount of commissions paid to brokers, who were responsible for the dental plan sale. Generally, these expenses follow the growth pattern of revenues, but not necessarily at the same pace, given that the company is changing its distribution channels in order to increase its margin and reduce the dependence on external brokers.

The company relies on many sources to distribute its service, such as external brokers, own sales team and retail stores. However, this year the company launched a new and more efficient distribution channel: the online selling, which will help the company to reach new clients with zero commissioning, resulting in an overall lower cost. In addition, bancassurance is becoming a more prominent and strategic distribution channel, resulting in a reduction of the selling commission from 17.5% to 12.5%, in comparison with retail store channels and external brokers. As a result, a reduction of the selling expenses's weight on NOR is forecasted for future periods.

In the last four years, selling expenses presented a constant performance profile, ranging between 9% and 9.5% of NOR. After the implementation of distribution channel structural changes, one may assume a growth for this item in line with sales, but must also take into consideration the efficiency of the new distribution channels. Thus, for the projections of selling expenses, 90% of the revenues growth rate is considered, emphasizing future cost improvements.

3.4 Other Items

Administrative Expenses

The most significant items of the administrative expenses are personnel costs, rentals and third parties services. This item will remain stable over the years, as a percentage of Net Operating Revenues because as the activity of the company expands, more personnel and third parties services are needed. For that, and based on historical analysis, 14% of the NOR is projected for all the explicit period.

Other Operating Expenses

Other operating expenses comprise 3 main items: allowance for doubtful receivables, stock option and profit sharing. These expenses are the less relevant costs of the company since it accounts for only 3.8% of NOR. Allowance for doubtful receivables is the most significant line of this item, representing 2.8% of the NOR in the last 4 years, on average. Since the company is changing its distribution channels to more reliable ones, it's expected a slightly decrease for the explicit period, as so it was assumed 2.5% onwards. The reminiscent items (stock option and profit sharing) were projected for 2015 onwards as the average between 2011 and 2014, being 0.5% and 0.6%, respectively.

Net Financial Income

Net financial income comprises three items: financial income, financial expenses and interest on capital ("IOC"). This line of the income statement represented 1.2% of NOR, on average, relatively to 2011, 2012, 2013, and was 1.3% in 2014. For the financial income and financial expenses, it is assumed a moving average of the last 4 years, for the explicit period. Relatively to interest on capital, it is estimated as a percentage of the company's capital, though being assumed 6.6% of NOR for the explicit period.

Current and Deferred Tax

Current tax represented 28.8% of Earnings before taxes ("EBT") on average, concerning 2011, 2012, 2013, being 28.9% in 2014, so the estimated current tax for the explicit period was 28.9%. A deferred tax refers to tax paid but not yet recognized in the income statement, so the taxes related to equity in subsidiaries (Brasildental) are deducted in this account preventing tax double counting. This thesis is assuming that there will be no significant changes in the corporate taxation policy in Brazil.

Cash

Cash is one item of the balance sheet that comprises cash, bank accounts and marketable securities, such as government bonds. This value was 265 million at the end of 2014. Cash is estimated by projecting the cash flow statement of the company for 2015. The final cash for the end of 2015 is estimated as R$ 315.9 million, and it is calculated accordingly the table shown below.

Table 2 – Cash – Cash Flow Statement of 2015

CF Statement (R$ thousand)	2015
Net Income	235,111
Equity in subsidiaries	- 5,592
Stock Option plan	8,419
Depreciation	7,500
Reserve for contingencies liabilities	53,314
CF Operations	63,641
Capex	- 16,000
INV. NWC	- 16,807
DIV	- 181,314
JCP	- 34,370
Initial cash (2015)	265,708
Final Cash	**315,968**
Increase/Decrease	50,260

Source: OdontoPrev and own calculations.

3.5 Equity in Subsidiaries

This item refers to all the entities over which OdontoPrev has significant influence or shares the control of the operational and financial policies, being valued through the equity method. Brasildental was established in 2013 aiming to distribute OdontoPrev's dental plan, conjointly with *Banco do Brasil*, through the bancassurance channel and started the operations in the beginning of 2015. OdontoPrev holds a 25% stake of this venture, being recognized as equity in subsidiaries in the income statement. In order to accurately estimate the ability of this vehicle to generate growth, a valuation of this joint venture is made separately and step by step.

The revenues of this vehicle are breakdown in two distinct groups: *Banco do Brasil* employees and *Banco do Brasil* – Distribution channel. These groups have a different average ticket, the first is considered 11 BRL per month, since it is directed to employees of *Banco do Brasil* - and then a price discount is applied. For the second group, an average ticket of 22.54 is estimated as a weighted average between SME's ticket (60%) and Individuals (40%), using data of the first half of the year, resulting in a ticket of 23.44 for the end of the year. The starting point to get an estimation of the average members is the number of clients that *Banco do Brasil* has – 60 million. For the first year, it is estimated the capture of 0.5% of clients of the bank, which is 300 thousand members for 2015. Regarding the growth considered during the explicit period, by 2021, 3.5% of the clients of the bank will have subscribed a dental plan (see **Appendix 9**).

All the costs of this joint venture are projected at the same percentage of NOR in an identical way as the forecasted income statement – except selling expenses, where it's expected to decrease due to the efficiency of the channel – low commissioning costs. As so, there is projected a growth of this line but only 75% of what is estimated for the income statement of the company as a whole. After estimating the income statement of the joint venture, and when the net income is reached, OdontoPrev will receive 25% of the dividends distributed, after the reinvestment needs were fulfilled. The item equity in subsidiaries is accounted in the income statement and thus is subject to taxes. Since this joint venture had been taxed previously, the value calculated for tax purposes, related with Brasildenta, will be deducted in deferred tax account.

3.6 CAPEX

Capital expenditures ("CAPEX") are the funds used by the company to invest in physical assets, such as properties, buildings and equipment, denominated as maintenance CAPEX, or to expand its activity by undertaking new projects (i.e. Opening a factory in a new market) – expansion CAPEX. The CAPEX outlay is interrelated with the industry where the company operates, being production, oil exploration, manufacturing and utilities where capital intensiveness is higher. OdontoPrev' business do not need high capital expenditure to maintain its activity due to their position on the value chain, acting as a broker between customers and dentists, though the only physical assets the company owns are its headquarters, equipment and a pair of dental clinics.

3.7 Depreciation

Depreciation is the method of allocating the cost of a tangible asset during its useful life. Companies depreciate its assets for both accounting and tax purposes: in accounting, it is employed to match the expense related with an asset, to the income which that asset helps the company generate; for tax purposes, the company can deduct this cost of tangible assets as an expense, reducing the taxable base. Sometimes, companies report the life period of an asset differently for tax purposes, perhaps to show a better performance of the company in a specific period, however, companies must depreciate assets in accordance with IFRS rules, taking into consideration how long it will last.

In the industry where OdontoPrev operates (dental insurance), companies usually do not hold large amounts of physical assets in their Balance sheets, mainly because they operate in the tertiary sector (services), as so they do not need the same amount of fixed assets comparatively to a company in the production or infrastructure sector. OdontoPrev's percentage of long-term assets in total assets is 14%, which demonstrate the non-dependence on physical assets to maintain and develop the activity. As a consequence, it is expected a low depreciation cost, proportionally, due to the little amount of physical assets to depreciate. Depreciation costs are forecasted for the explicit period as a percentage of gross PPE (property, plant & equipment), since this account has shown a consistent trend in the last 4 years, between 28% and 35%. In that way, it was assumed a depreciation growth at 30% of the gross PPE. For the estimations of CAPEX and Depreciations (see **Appendix 10).**

3.8 Net Working Capital

Working capital measures the ability of a company to pay its short-term liabilities with short-term assets, without using other sources of financing. This analysis evaluates the company's health by looking at its short-term financial efficiency: If the company fails to accomplish its obligations towards creditors, then will be in trouble because will have to fall back upon in more expensive sources of credit than if had prepared itself for this situation. Net working capital ("NWC") calculation it's a crucial step of the valuation for the reason that it has to be subtracted in the FCFE formula. An increase in NWC is considered a negative cash flow, because it's an increasing requirement of capital for the operations of the company so it is not available to equity. The way to compute NWC is shown below:

Equation 14 – Net Working Capital Calculation

$$Net\ Working\ Capital = Current\ Assets - Current\ liabilities$$

Or,

$$Net\ Working\ Capital = Accounts\ Receivable - Accounts\ Payable + Inventory$$

Where,

$$Accounts\ Receivable = NOR * \frac{DSO}{365}$$

$$DSO = days\ sales\ outstanding$$

$$Accounts\ Payable = Cost\ of\ Services * \frac{DPO}{365}$$

$$DPO = days\ payable\ outstanding$$

$$Inventory = Cost\ of\ services * \frac{DSI}{365}$$

$$DSI = days\ sales\ inventory$$

It is assumed for the explicit period that the DSO, DPO and DSI remain the same figures of 2015. These ratios were calculated for 2015 as the average of the last four years, therefore it is projected that value for 2015 onwards. In the FCFE calculation, one should subtract the variation of NWC (see **Appendix 11**).

3.9 DCF Valuation

The DCF valuation is the sum and culmination of all the assumptions explained above. The income statement is forecasted until 2021, same as depreciation, CAPEX and NWC. The FCFE will be projected for the explicit period and discounted at the cost of equity, calculated according the CAPM approach, adding a country risk premium and an inflation differential as explained above. The table with the cost of equity calculations is shown above:

Table 3 - Cost of Capital (Re) Calculation

CAPM	2014	2015	2016	2017	2018	2019	2020	2021
Cost of Equity - Re	13.1%	15.0%	10.8%	9.8%	9.7%	9.8%	9.7%	9.7%
Rf	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Equity Risk Premium (ERP)	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%
Beta	0.437	0.437	0.437	0.437	0.437	0.437	0.437	0.437
Country Risk Premium	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%
Inflation Dif	5.5%	7.5%	3.2%	2.3%	2.2%	2.3%	2.2%	2.2%
Average Differential Inflation (2015 - 2018)		*3.8%*						

CAPM	2015
Cost of Equity - Re	**11.3%**
Rf	2.2%
ERP (Rm-Rf)	5.8%
Beta	0.44
Country Risk Premium	2.9%
Average Differential Inflation (2015-2018)	3.8%

Source: Own calculation

Cost of equity for 2015 is calculated starting with the Rf rate, adding next the country risk premium and the average inflation differential, subsequently is added a premium resulting from beta times ERP. The CAPM approach outcomes a cost of equity of 11.3%, reflecting the rate demanded for the shareholder's investment.

Starting with the net income projections (see **Appendix 12**), the free cash flows to equity are calculated according to the equation 5, presented in the literature review. After that, these cash flows are discounted for 2015 at the cost of equity, during the explicit period and for the terminal value, it is assumed a spread between cost of equity and the growth rate as a discount factor, in perpetuity. Subsequently, the terminal value is discounted back from 2021 to 2015.

After discounting the cash flows, correspondent to the enterprise value of the company, the net debt (debt – cash) should added, to reach the equity value of the company.

Table 4 – FCFE and Equity Value

FCFE (R$ thousand)	2016	2017	2018	2019	2020	2021 (TV)
Net Income	280.5	314.9	354.1	405.7	448.6	494.7
- CAPEX	-17.6	-19.4	-21.3	-23.4	-25.8	-28.3
+ Depreciation	7.9	8.3	8.7	9.1	9.6	10.1
- Change in NWC	-11.3	-9.3	-10.1	-11.0	-12.0	-13.2
FCFE	259.5	294.5	331.4	380.4	420.4	463.2
Re	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%
Year	1	2	3	4	5	6
Discount factor	0.898	0.807	0.725	0.651	0.585	15.775
g						5.0%
Discounted FCFE	233	238	240	248	246	
Terminal Value (TV)						7,671
PV (TV)						4,030

Enterprise Value		**5,234**
Net Debt	-	316
Equity Value		**5,550**
Price (31-12-15)		**10.45**
Price (28-08-15)		9.79
Up/Downside Potential		*6.7%*
Number of Shares		531,295
Treasury Shares		3,918

Source: Own calculations

The enterprise value ("EV") of the company is R$ 5,234 million and net debt is R$ (316) million – the company structure is debt free, so this value refers to cash. By subtracting net debt to EV, one obtained the equity value of the company - R$ 5,550 million. The equity value is then divided by the number of shares available for sale (531 million), giving a price per share of R$ 10.45, on the 31th of December 2015. The price per share reflects an upside potential of 6.7% when compared with the value of the share on the 28th of August 2015. After examining the estimated price per share of OdontoPrev, one should recommend investors to hold the investment.

3.10 Sensitivity Analysis

After the DCF valuation and in order to observe what would be the value of the company when key variables change, such as cost of capital and the growth rate, a sensitivity analysis is implemented. These variables were stressed to a plus/minus 1% test for each side and the results shown a price range between R$ 9.36 and R$ 11.98. The sensitivity analysis is shown below:

Table 5 – Sensitivity Analysis

Price		-1%	-0.5%	Re	+0.5%	1%
Dec-2015	10.45	10.3%	10.8%	**11.3%**	11.8%	12.3%
-1%	4.0%	9.37	9.37	**9.36**	9.36	9.36
-0.5%	4.5%	9.88	9.88	9.87	9.87	9.87
g	**5.0%**	10.47	10.47	**10.45**	10.46	10.46
+0.5%	5.5%	11.16	11.16	11.16	11.15	11.15
1%	6.0%	11.98	11.98	**11.98**	11.98	11.97

Source: Own calculations

The sensitivity analysis provided an empirical support for the recommendation previously given – hold. In that sense, on the worst case scenario, an investor will lose 12% of the value invested and in the best case view will earn 14% of that amount. This is only valid on the assumption that the elasticity of the key variables will follow the pattern previously analyzed.

3.11 Relative Valuation

This valuation exercise will use equity multiples rather than enterprise multiples, mainly for two reasons: DCF model chosen – FCFE; sector of activity – insurance firm. Enterprise multiples lead to value distortions, due to differences in capital structures, i.e. OdontoPrev do not has debt so will not be fairly compared against a leveraged company. The equity multiples chosen to undertake this valuation are PBV and PER since these ratios are the most used ones across equity multiples and also lead to better value estimations in financial services firms.

Since OdontoPrev is the market leader in its sector, there is no company with similar performance in the Brazilian market. As such, to better reflect the company's performance, the construction of two peer groups is necessary – one composed by South American companies and another by international ones. The first group consisted of dental care providers in Brazil. OdontoPrev, SulAmérica, Dasa and Qualicorp are the selected companies given this criterion. On a first stage selection, SulAmérica and Dasa are excluded, since they presented too much leveraged to be considered comparable to OdontoPrev – both D / V ratios are higher than 30%. Though, using Qualicorp as a peer and after analyzing the PER and PBV ratios, the following prices are obtained:

Table 6 – National Peer Group

National Peer Group	PER FY1	PBV	ROE	EV (R$ thousand)
OdontoPrev	24.14	8.62	0.31	5,203,475
Qualicorp	16.56	2.27	0.06	5,012,569
Average	**20.35**	5.45	0.19	
OdontoPrev	**Net Income (2015)**	**Book value**		
	235.1	495.1		
OdontoPrev	**Price (R$)**	**Price (R$)**		
	9.00	5.07		

Source: Bloomberg Terminal and own calculations.

According to the Price Earnings Ratio (PER), the value per share of the company is R$ 9 and the PBR is R$ 5.07. The latter result reflects the strong influence of the PBV of Qualicorp in this analysis. This may signal an overvaluation of OdontoPrev since its PBV is 4 times higher Qualicorp's indicator of 2.27. The multiple used to support the DCF Valuation is the PER for 2015 due to proximity of the ratios of the two companies.

For the construction of the international peer group, companies with operations in the U.S. were taken into account – this is because this marketplace is a reference for the Brazilian economy and has a wide variety of healthcare firms, with stronger operations and financial performance when compared to OdontoPrev. Global players such as UnitedHealthcare, Aetna, Cigna and Centene were included. The peers chosen for the comparison were selected based on the weight of debt in its capital structure – a maximum limit of 15% in their D / V ratio was established as an acceptance criterion. The results are the following:

Table 7– International Peer Group

International Peer Group	PER FY1	PBR	ROE	EV (R$ thousand)
OdontoPrev	24.14	8.62	31.4%	5,203,475
UnitedHealthcare Group	19.16	3.47	18.5%	434,371,951
Aetna Inc	15.68	2.68	15.5%	155,962,526
Cigna Corp	16.66	3.26	19.1%	133,867,331
Centene Corp	24.63	4.30	19.9%	26,269,469
Average	**20.05**	4.47	20.9%	
Median	19.16	3.47	19.1%	

Net Income (2015)	Book Value
235.1	495.7
Price (R$)	**Price (R$)**
8.87	4.17

Source: Bloomberg Terminal and own calculations.

A more consistent relative valuation is registered with the PER indicator, as shown by the price per share - R$ 8.87. The PBV, on the other hand, is even smaller than the one recorded in the national peer group, which may indicate not only that the Brazilian stock market is overvalued as a whole when compared with mature markets, but also that OdontoPrev's leadership position and the constant good performance in the stock market (outperform), strongly bias the asset comparison with other peers. Before presenting the conclusions reached, it is important to mention that the relative valuation exercise is used in this thesis to monitor the DCF approach and, as such, the results of the PER will only be a complement to the DCF analysis. The conclusions of this analysis are strongly influenced by OdontoPrev's leading position in Brazil and consequent overvalued indicators – when compared with similar companies, with national and international operations, the results indicate that a market leader in its sector will seem overvalued.

4. Investment Bank Report Comparison

OdontoPrev has a strong analyst coverage of 13 investment banks, including not only global players such as J.P Morgan, Morgan Stanley, HSBC and Santander but also local based banks: BTG Pactual, Itaú BBA and Votorantim Corretora. The analyst chosen for the valuation comparison is Thiago Macruz from Itaú BBA and the research report dates to the 20th of July 2015, being the estimated fair value of OdontoPrev on December 2015 of R$ 10.3 The value of the company was estimated according to the DDM approach, during an explicit period of 12 years (2016 – 2028), significantly higher than the one that has been assumed for OdontoPrev's valuation – 5 years for the explicit period and one year as a terminal value. The key valuation figures comparison is presented below:

Table 8 – Comparison of the Key Variables Estimations

Analyst Estimates (R$ million)	2015	2016	2017	2018	2019
NOR	1210	1377	1563	1761	1967
NOR Growth		14%	14%	13%	12%
EBITDA	333	400	464	582	652
Net Income	233	280	316	393	442
Net Debt	-338	-343	-349	-356	-365
PER	25	21	19	15	13
PBV	8	8	8	8	8

OdontoPrev Estimates (R$ million)	2015	2016	2017	2018	2019
NOR	1258	1414	1555	1707	1874
NOR Growth		*12%*	*10%*	*10%*	*10%*
EBITDA	336	398	439	484	534
Net Income	235	281	315	354	406
Net Debt	-316				
PER	24				
PBV	9				

Source: Itaú BBA report and own calculations

The analyst NOR estimations are in line with the ones projected for the equity valuation of OdontoPrev, being particularly higher in 2019, R$ 1,967 vs. R$ 1,874. The net income forecast presents higher figures also in 2019, R$ 442 vs. R$ 406. The dissimilarity of the analyst valuation from the one performed will lie in the cost of equity, which will be greater, thus offsetting this differences and equaling both valuations.

The cost of capital assumed by the analyst in this valuation varies over the explicit period, where inflation differential oscillates, resulting in a Re of 13.6%, on average (see **Appendix 13**). The growth rate used for the terminal value perpetuity is 5% - in line with the growth rate estimated for this valuation.

By discounting the future dividends and calculating the terminal value, the analyst reached to a total equity value of the company of R$ 5,236 million, correspondent to the equity value per share of R$ 9.9. After that the dividend of 2015 is added – R$ 0.4, giving a total equity value per share of R$ 10.3.

Table 9 – Valuation performed by Itaú BBA's analyst

Itaú BBA Valuation (R$ million)	2015
Equity Value	3231
Perpetuity Value (g=5%)	2005
Total equity value	**5236**
Equity per share	9.9
Dividend per share 2015	0.4
Analyst Fair value	**10.30**
OdontoPrev	**10.45**

Source: Itaú BBA report and own calculations.

The value per share estimated by the analyst is very close to the one calculated in the DCF valuation of this thesis, so the only fact one could retain is that when close assumptions are used (i.e. NOR and Re), undertaken by a different equity valuation method, the results provide similar outcomes. It is important to stress that the estimated share price of the company is very close to the consensus of all the investment banks covering the company - 10.45 vs. 10.80 (see **Appendix 14**).

5. Conclusion and Limitations

The objective of this master thesis is to value the price of OdontoPrev's stock, through the application of diverse valuation methods, each of them leading to different outcomes. The first conclusion is that the valuation model chosen has to be adapted to match the company structure and industry sector, leading to accurate assumptions about future performance.

The DCF Valuation – FCFE is considered the most relevant method for valuing OdontoPrev, being relative valuation used as a benchmark to confirm the DCF price per share of R$ 10.45, an upside of 6.7% comparatively to the price on the 28th of August 2015.

One limitation of this thesis is the fact that the company only started to disclosure the revenues breakdown by segment in the first semester of 2015, with lack of detailed past information. If the historical performance by segment had been provided, the precision of the revenues' forecast would be higher, because each of the operational segments follows a different selling strategy and also distinct growth opportunities and margins.

The proposed estimated fair value of OdontoPrev was achieved with the academic support of all the models stated above, data from the IMF and with the personal judgement over the company's future performance. Since the company operates in a very volatile market, none the less with further room for growth, the investment strategy proposed is to hold the share.

Appendix 1 – Additional Literature Review

1.4.8.1 Residual Income Valuation

According to (Stowe et al., 2007), residual income valuation analyzes the intrinsic value of equity in two main sections: the current equity book value and the present value of expected future residual income[17]. The value of the stock can be expressed as follows:

Equation 15 – Residual Income Valuation

$$V_0 = B_0 + \sum_{t=1}^{\infty} \left(1 \frac{Et - rBt - 1}{(1+r)\hat{}t}\right)$$

Where:

$Vo = \ value\ of\ a\ share$

$Bo = current\ per\ share\ book\ value\ of\ equity$

$Bt = \ expected\ per\ share\ book\ value\ of\ equity\ at\ any\ time\ t$

$r = required\ rate\ of\ return\ on\ equity\ (cost\ of\ equity)$

$Et = \ expected\ EPS\ for\ period\ t$

$Bo = current\ per\ share\ book\ value\ of\ equity$

$RI = expected\ per\ share\ residual\ income\ , equal\ to\ E_t - rBt - 1$

The residual income approach starts the valuation process in a different way comparatively to other DCF models: the valuation begins with the book value of equity and then adjusts this value by adding the present values of the expected future residual income.

After the estimations of future residual incomes during the explicit period, a continuing residual income (after the forecasted horizon) is projected for the future. According to (Stowe et al., 2007), "unlike in other models, the terminal value is not a major driver of value in a residual income approach". This fact differentiates this model from the other DCF models, where the influence of the terminal value in the valuation is substantially higher.

[17] The amount of income that a company has left after all debt paid.

1.4.9 Contingent Claim Valuation

Contingent Claim valuation uses option pricing models to measure the value of the company, for instance Black Scholes model. The method is indicated for industries where the investment is intensive and there is a high degree of uncertainty (Frykman & Tolleryd, 2003)

A contingent claim only pays off under certain circumstances, so this option-pricing model tries to measure a value of an asset based on expectations and probabilities about a future event. According to (Damodaran, 2005), this valuation method brings a revolutionary discussion where "the value of an asset may be greater than the present value of expected cash flows if the cash flows are contingent on the occurrence or not nonoccurrence of an event".

According to (Damodaran, 2005), a good example of where this valuation makes sense is oil reserves, i.e. Petrobras, the biggest Brazilian oil company: The valuation of an oil reserve could be valued based on future oil prices; however, these predictions will miss the fact that Petrobras will only develop the oil reserve if oil prices go up, thus option pricing models takes into consideration this view.

1.4.10 Liquidation and Accounting Valuation

Liquidation and accounting valuation tend to arrive at the company's residual value assuming that the company sells of all assets and pays off all the liabilities. Liquidity value may be different from the book value because when a company sells of all the assets may receive less than its market value. Valuing the existing assets of a firm with accounting estimates or book value often used as a starting point (Damodaran, 2005). This valuation approach proposes that a value of a company is the sum of the values of the individual assets owned by the business.

Concluding, these two methods are useful in exceptional circumstances, however the situation of the company, industry and financial condition are not exceptional, so these two topics will not be used in the valuation neither will be further discussed.

Appendix 2 – Beta Calculation

ODPV3	Daily		**Weekly**		Monthly	
4y	Beta	0.31	Beta	0.41	Beta	0.29
5y	Beta	0.36	Beta	**0.44**	Beta	0.31

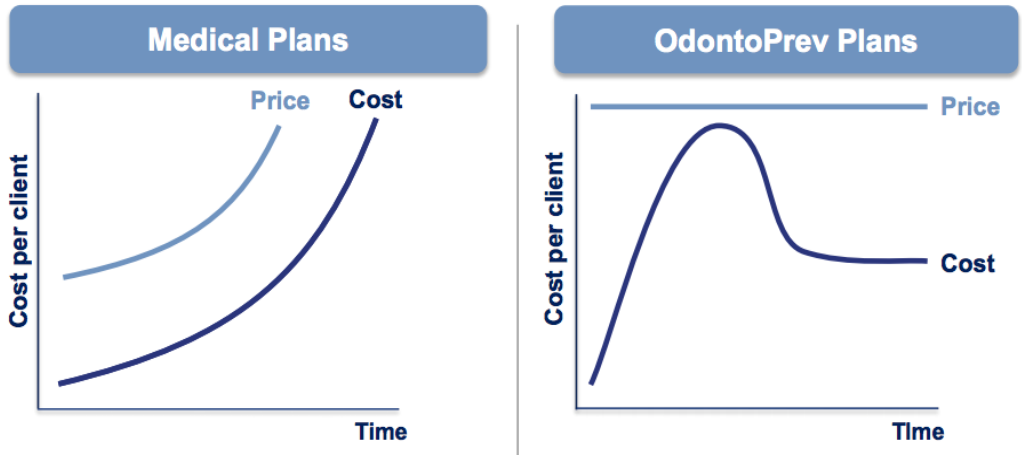
Source: Bloomberg and own calculations.

Appendix 3 – OdontoPrev Membership Growth vs. Dental Plans and Healthcare Plans (Medical Plans) - (values in million).

Year	OdontoPrev	Market Share		ANS - Total Members (thousand)			
			Δ%	Dental Plans	Δ%	Healthcare Plans	Δ%
2000	447	17.2%	*0%*	2,603	0.0%	31,161	0.0%
2001	544	17.8%	*22%*	3,063	17.7%	31,727	1.8%
2002	613	16.7%	*13%*	3,678	20.1%	31,513	-0.7%
2003	763	17.6%	*24%*	4,326	17.6%	32,075	1.8%
2004	943	17.7%	*24%*	5,313	22.8%	33,841	5.5%
2005	1,132	18.2%	*20%*	6,204	16.8%	35,441	4.7%
2006	1,492	20.3%	*32%*	7,350	18.5%	37,248	5.1%
2007	2,113	23.1%	*42%*	9,164	24.7%	39,316	5.6%
2008	2,460	22.2%	*16%*	11,061	20.7%	41,468	5.5%
2009	4,175	31.5%	*70%*	13,260	19.9%	42,575	2.7%
2010	4,978	34.3%	*19%*	14,511	9.4%	44,923	5.5%
2011	5,533	32.8%	*11%*	16,854	16.1%	46,145	2.7%
2012	5,976	31.6%	*8%*	18,914	12.2%	47,866	3.7%
2013	6,172	30.6%	*3%*	20,144	6.5%	49,495	3.4%
2014	6,316	29.7%	*2%*	21,263	5.6%	50,820	2.7%

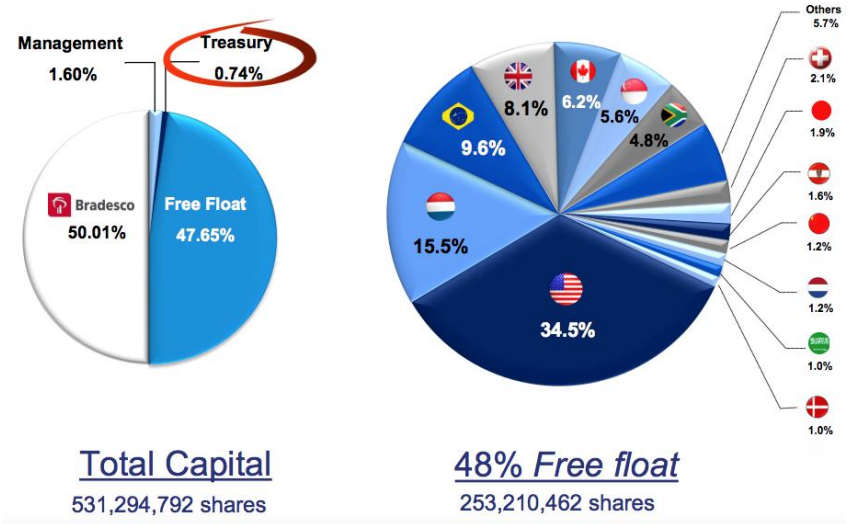
Source: ANS and own calculations.

Appendix 4 - Cost Pattern of Medical Plans vs. Dental Plans



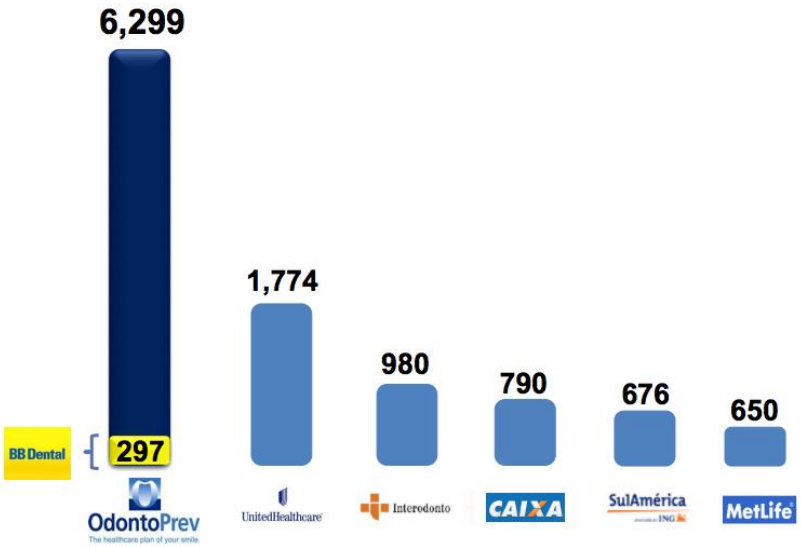
Source: OdontoPrev Corporate Presentation September 2015.

Appendix 5 – Company Shareholding Structure



Source: OdontoPrev Corporate Presentation September 2015.

Appendix 6 – Number of Members of the Main Players (thousand)



Source: OdontoPrev Corporate Presentation September 2015.

Appendix 7 – Net Operational Revenue Breakdown and Projections

REVENUES (R$ thousand)	2012	2013	2014	2015	2016E	2017E	2018E	2019E	2020E	2021E
Members	5,976	6,172	6,316							
Average Members	**5,755**	**6,074**	**6,244**	**6,488**	**6,754**	**7,121**	**7,508**	**7,917**	**8,347**	**8,801**
Growth	*9%*	*6%*	*3%*	*4%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*
Average Ticket (R$/Live/Month) (NOR)	**13.84**	**14.67**	**15.43**	**16.64**	**17.44**	**18.20**	**18.95**	**19.73**	**20.52**	**21.35**
Growth	*4%*	*6%*	*5%*	*8%*	*5%*	*4%*	*4%*	*4%*	*4%*	*4%*
Efective Inflation & Expected Inflation	*6%*	*6%*	*6%*	*8%*	*5%*	*5%*	*5%*	*5%*	*4%*	*4%*
Growth / Inflation (%)	*77%*	*103%*	*80%*	*98%*	*90%*	*90%*	*90%*	*90%*	*90%*	*90%*
NOR	**955,483**	**1,069,606**	**1,156,121**	**1,295,615**	**1,413,574**	**1,554,831**	**1,707,429**	**1,874,047**	**2,055,752**	**2,255,074**
Growth	*14%*	*12%*	*8%*	*12%*	*12%*	*10%*	*10%*	*10%*	*10%*	*10%*

Source: OdontoPrev Annual Reports and own calculations.

Appendix 8 – Cost of Services Breakdown and Projections

COST OF SERVICES (R$ thousand)	2011	2012	2013	2014	2015	2016E	2017E	2018E	2019E	2020E	2021E
Cost of services	- 416,464	- 485,528	- 501,165	- 548,837	- 591,203	- 650,244	- 715,222	- 785,417	- 862,062	- 945,646	- 1,037,334
% NOR	*50%*	*51%*	*47%*	*47%*	*47%*	*46%*	*46%*	*46%*	*46%*	*46%*	*46%*
Claims	- 352,470	- 426,859	- 451,644	- 476,031	- 514,876	- 567,654	- 628,191	- 689,844	- 757,163	- 830,576	- 911,107
% NOR	*42%*	*45%*	*42%*	*41%*	*41%*	*40%*	*40%*	*40%*	*40%*	*40%*	*40%*
% Cost of Services	*85%*	*88%*	*90%*	*87%*	*87%*	*87%*	*88%*	*88%*	*88%*	*88%*	*88%*
Payroll charges on services	- 26,564	- 29,882	- 31,839	- 32,926							
% Cost of Services	*6%*	*6%*	*6%*	*6%*							
Dental materials	- 4,025	- 3,781	- 4,582	- 4,643							
% Cost of Services	*1%*	*1%*	*1%*	*1%*							
Other expenses	- 33,405	- 25,006	- 13,100	- 35,237	- 29,560	- 32,512	- 35,761	- 39,271	- 43,103	- 47,282	- 51,867
Others			- 21,764	- 19,950							
Provision of events that occured (PEONA)			8,664	- 15,287	- 3,312	- 9,299	- 9,299	- 9,299	- 9,299	- 9,299	- 8,301
% Cost of Services	*8%*	*5%*	*3%*	*6%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*
NOR	***835,263***	***955,483***	***1,069,606***	***1,156,121***	***1,257,878***	***1,413,574***	***1,554,831***	***1,707,429***	***1,874,047***	***2,055,752***	***2,255,074***

Source: OdontoPrev Annual Reports and own calculations.

Appendix 9 – Brasildental (Joint Venture) – Income Statement Forecast

BRASILDENTAL (thousands)	2015	2016E	2017E	2018E	2019E	2020E	2021E
Revenues							
Banco do Brasil Employees	280	277	283	286	286	287	287
Growth (GDP, cosntant)	*-1%*	*1%*	*2%*	*2%*	*2%*	*2%*	*2%*
Average Ticket (R$/Live/Month)	11.00	11.86	12.43	12.97	13.51	14.06	14.63
Growth / Inflation (%)	*8%*	*5%*	*4%*	*4%*	*4%*	*4%*	*4%*
NOR Employees	36,960	39,451	42,192	44,566	46,441	48,403	50,388
Banco do Brasil - Distribution channel	300	600	900	1,350	1,688	1,941	2,135
Growth	*100%*	*50%*	*50%*	*25%*	*15%*	*10%*	*5%*
% Banco do Brasil Members	*1%*	*1%*	*2%*	*2%*	*3%*	*3%*	*4%*
Average Ticket (R$/Live/Month)	23.44	25.28	26.50	27.64	28.79	29.97	31.18
Growth / Inflation (%)	*8%*	*5%*	*4%*	*4%*	*4%*	*4%*	*4%*
NOR Distribution Channel	84,376	181,993	286,147	447,759	582,925	697,827	798,602
NOR (Total)	**121,336**	**221,444**	**328,339**	**492,325**	**629,367**	**746,230**	**848,990**
-Cost of Services	37,639	101,864	151,036	226,469	289,509	343,266	390,535
% NOR	*31%*	*46%*	*46%*	*46%*	*46%*	*46%*	*46%*
-Selling expenses	8,436	15,571	22,855	33,870	42,771	50,067	56,236
% NOR	*7%*	*7%*	*7%*	*7%*	*7%*	*7%*	*7%*
-Administrative Expenses	12,251	25,479	40,061	62,686	81,610	97,696	111,804
% NOR	*15%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*
EBITDA	63,011	78,530	114,387	169,299	215,477	255,201	290,414
-Depretiation	12.13	22.14	32.83	49.23	62.94	74.62	84.90
% NOR	*0.01%*	*0.01%*	*0.01%*	*0.01%*	*0.01%*	*0.01%*	*0.01%*
EBIT	62,999	78,508	114,354	169,250	215,414	255,127	290,329
+Financial Results	12.13	22.14	32.83	49.23	62.94	74.62	84.90
% NOR	*0.01%*	*0.01%*	*0.01%*	*0.01%*	*0.01%*	*0.01%*	*0.01%*
EBT	63,011	78,530	114,387	169,299	215,477	255,201	290,414
Taxes	18,273	22,774	33,172	49,097	62,488	74,008	84,220
% EBT	*29%*	*29%*	*29%*	*29%*	*29%*	*29%*	*29%*
Net Income	**44,738**	**55,756**	**81,215**	**120,202**	**152,989**	**181,193**	**206,194**
DPR	*50%*	*50%*	*50%*	*50%*	*75%*	*75%*	*75%*
Dividend	22,369	27,878	40,607	60,101	114,742	135,895	154,646
OdontoPrev's stake (25%)	**5,592**	**6,970**	**10,152**	**15,025**	**28,685**	**33,974**	**38,661**

Source: Own calculations.

Appendix 10 – CAPEX and Depreciations Forecast

CAPEX & Depretiation (R$ thousand)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
CAPEX	7,000	10,600	10,900	18,500	16,000	17,600	19,360	21,296	23,426	25,768	28,345
%NOR	*0.8%*	*1.1%*	*1.0%*	*1.6%*	*1.3%*	*1.3%*	*1.3%*	*1.3%*	*1.3%*	*1.3%*	*1.3%*
NOR	835,263	955,483	1,069,606	1,156,121	1,257,878	1,413,574	1,554,831	1,707,429	1,874,047	2,055,752	2,255,074
Depreciation	6,173	5,159	5,140	6,761	7,500	7,875	8,269	8,682	9,116	9,572	10,051
% Gross PPE	*36.2%*	*35.0%*	*34.1%*	*28.4%*	*30.0%*	*30.0%*	*30.0%*	*30.0%*	*30.0%*	*30.0%*	*30.0%*
Gross PPE	17,067	14,748	15,064	23,787	25,000	26,250	27,563	28,941	30,388	31,907	33,502

Source: OdontoPrev Annual Reports and own calculations.

Appendix 11– Net Working Capital Forecast

NWC MAP (R$ thousand)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Healthcare Receivables	88,572	100,305	85,627	99,117	118,494	133,161	146,467	160,842	176,538	193,655	212,431
DSO (days)	*39*	*38*	*29*	*31*	*34*	*34*	*34*	*34*	*34*	*34*	*34*
Advances	10,137	9,499	11,321	8,971	12,711	14,285	15,712	17,254	18,938	20,774	22,788
DSO (days)	*4*	*4*	*4*	*3*	*4*	*4*	*4*	*4*	*4*	*4*	*4*
Var (Receivables)		**11,095**	**- 12,856**	**11,140**	**23,117**	**16,240**	**14,734**	**15,917**	**17,379**	**18,953**	**20,791**
NOR	835,263	955,483	1,069,606	1,156,121	1,257,878	1,413,574	1,554,831	1,707,429	1,874,047	2,055,752	2,255,074
Suppliers	9,694	8,916	14,728	10,192	13,243	14,565	16,021	17,593	19,310	21,182	23,236
DPO (days)	*8*	*7*	*11*	*7*	*8*	*8*	*8*	*8*	*8*	*8*	*8*
Other Liabilities	30,949	23,185	33,703	33,556	37,017	40,714	44,783	49,178	53,977	59,211	64,951
DPO (days)	*27*	*17*	*25*	*22*	*23*	*23*	*23*	*23*	*23*	*23*	*23*
Var (Payables)	**-**	**8,542**	**16,330**	**- 4,683**	**6,512**	**5,019**	**5,524**	**5,968**	**6,516**	**7,106**	**7,795**
Cost of Services	416,464	485,528	501,165	548,837	591,203	650,244	715,222	785,417	862,062	945,646	1,037,334
Stock	784	987	954	932	1,134	1,247	1,372	1,506	1,653	1,814	1,989
DSI (days)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Var (Stock)		**203**	**- 33**	**- 22**	**202**	**113**	**125**	**135**	**147**	**160**	**176**
Cost of Services	416,464	485,528	501,165	548,837	591,203	650,244	715,222	785,417	862,062	945,646	1,037,334
NWC (AR-AP+S)		78,690	49,471	65,272	82,079	93,413	102,748	112,832	123,843	135,850	149,022
Var (NWC)			- 29,219	15,801	16,807	11,334	9,335	10,084	11,011	12,008	13,172

Source: Own calculations.

Appendix 12 - Income Statement for the Explicit Period – Net Income Forecast

INCOME STATEMENT (R$ thousand)	2012	2013	2014	2015	2016E	2017E	2018E	2019E	2020E	2021E
Net Operating Revenue (NOR)	**955,483**	**1,069,606**	**1,156,121**	**1,257,878**	**1,413,574**	**1,554,831**	**1,707,429**	**1,874,047**	**2,055,752**	**2,255,074**
NOR Growth	*14.4%*	*11.9%*	*8.1%*	*8.8%*	*12.4%*	*10.0%*	*9.8%*	*9.8%*	*9.7%*	*9.7%*
Cost of services	- 485,528	- 501,165	- 548,837	- 591,203	- 650,244	- 715,222	- 785,417	- 862,062	- 945,646	-1,037,334
% NOR	*50.8%*	*46.9%*	*47.5%*	*47.0%*	*46.0%*	*46.0%*	*46.0%*	*46.0%*	*46.0%*	*46.0%*
Gross Income	469,955	568,441	607,284	666,676	763,330	839,609	922,012	1,011,986	1,110,106	1,217,740
% NOR	*49.2%*	*53.1%*	*52.5%*	*53.0%*	*54.0%*	*54.0%*	*54.0%*	*54.0%*	*54.0%*	*54.0%*
Selling expenses	- 88,832	- 99,226	- 109,446	- 116,604	- 132,530	- 144,307	- 156,620	- 169,811	- 183,903	- 199,165
% NOR	*9.3%*	*9.3%*	*9.5%*	*9.3%*	*9.4%*	*9.3%*	*9.2%*	*9.1%*	*8.9%*	*8.8%*
Contribution Margin	381,123	469,215	497,838	550,072	630,800	695,302	765,391	842,174	926,203	1,018,575
%NOR	*39.9%*	*43.9%*	*43.1%*	*43.7%*	*44.6%*	*44.7%*	*44.8%*	*44.9%*	*45.1%*	*45.2%*
Administrative expenses	- 147,643	- 159,747	- 171,421	- 182,632	- 197,900	- 217,676	- 239,040	- 262,367	- 287,805	- 315,710
% NOR	*15.5%*	*14.9%*	*14.8%*	*14.5%*	*14.0%*	*14.0%*	*14.0%*	*14.0%*	*14.0%*	*14.0%*
Other Operating Expenses	- 32,824	- 46,485	- 51,492	- 47,735	- 50,813	- 55,149	- 59,829	- 64,935	- 70,500	- 76,599
% NOR	*3.4%*	*4.3%*	*4.5%*	*3.8%*	*3.6%*	*3.5%*	*3.5%*	*3.5%*	*3.4%*	*3.4%*
Allowance for doubtful receivables	- 22,566	- 35,840	- 33,316	- 31,447	- 35,339	- 38,871	- 42,686	- 46,851	- 51,394	- 56,377
%NOR	*2.4%*	*3.4%*	*2.9%*	*2.5%*	*2.5%*	*2.5%*	*2.5%*	*2.5%*	*2.5%*	*2.5%*
Stock option	- 3,624	- 6,350	- 7,738	- 8,419	- 7,556	- 8,311	- 9,126	- 10,017	- 10,988	- 12,054
%NOR	*0.4%*	*0.6%*	*0.7%*	*0.5%*	*0.5%*	*0.5%*	*0.5%*	*0.5%*	*0.5%*	*0.5%*
Profit sharing	- 6,634	- 4,295	- 10,438	- 7,868	- 7,918	- 7,967	- 8,017	- 8,067	- 8,118	- 8,168
%NOR	*0.7%*	*0.4%*	*0.9%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*
Equity in subsidiaries	- 728	102	- 1,470	5,592	6,970	10,152	15,025	28,685	33,974	38,661
% NOR	*-0.1%*	*0.0%*	*-0.1%*	*0.4%*	*0.5%*	*0.7%*	*0.9%*	*1.5%*	*1.7%*	*1.7%*
Income before finance income and taxes (EBIT)	**199,928**	**263,085**	**273,455**	**325,297**	**389,056**	**432,629**	**481,547**	**543,558**	**601,871**	**664,927**
% NOR	*20.9%*	*24.6%*	*23.7%*	*25.9%*	*27.5%*	*27.8%*	*28.2%*	*29.0%*	*29.3%*	*29.5%*
Net Financial Income	13,233	11,914	14,696	16,543	13,746	14,304	14,325	14,726	14,577	14,336
% NOR	*1.4%*	*1.1%*	*1.3%*	*1.3%*	*1.0%*	*2.0%*	*1.8%*	*1.7%*	*1.5%*	*1.4%*
Financial income	22,674.00	23,533.00	33,842.00	27,313.20	26,703.64	26,813.17	27,641.00	28,462.60	27,386.72	27,401.43
%NOR	*2.4%*	*2.2%*	*2.9%*	*2.2%*	*1.9%*	*1.7%*	*1.6%*	*1.5%*	*1.3%*	*1.2%*
Financial expenses	-42,085.00	-44,828.00	-51,987.00	-45,140.80	-46,570.76	-46,122.31	-46,929.77	-47,350.13	-46,422.76	-46,679.15
%NOR	*4.4%*	*4.2%*	*4.5%*	*3.6%*	*3.3%*	*3.0%*	*2.7%*	*2.5%*	*2.3%*	*2.1%*
Interest on capital (IOC)	32,644.00	33,209.00	32,841.00	34,370.20	33,613.25	33,613.25	33,613.25	33,613.25	33,613.25	33,613.25
%NOR	*3.4%*	*3.1%*	*2.8%*	*2.7%*	*2.4%*	*2.2%*	*2.0%*	*1.8%*	*1.6%*	*1.5%*
%Capital	*6.4%*	*6.6%*	*6.5%*	*6.9%*	*6.6%*	*6.6%*	*6.6%*	*6.6%*	*6.6%*	*6.6%*
Income before taxes and profit sharing (EBT)	213,161	274,999	288,151	341,840	402,802	446,933	495,872	558,283	616,449	679,263
Current tax	- 47,062	- 77,814	- 83,339	- 98,867	- 116,498	- 129,262	- 142,303	- 153,170	- 168,463	- 185,275
% EBT	*22.1%*	*28.3%*	*28.9%*	*28.9%*	*28.9%*	*28.9%*	*28.7%*	*27.4%*	*27.3%*	*27.3%*
Deferred tax	- 20,336	- 8,749	- 9,820	- 8,198	- 6,177	- 3,233	-	-	-	-
% EBT	*9.5%*	*3.2%*	*3.4%*	*2.4%*	*1.5%*	*0.7%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Net income before participation of minoritary shareholders	145,763.0	188,436.0	194,992.0	234,774.8	280,126.9	314,437.9	353,568.4	405,113.2	447,985.4	493,988.4
Participation of minoritary shareholders	- 197.0	- 345.0	- 283.0	335.7	402.8	446.9	495.9	558.3	616.4	679.3
% EBT	*0.1%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*
Net income (IFRS)	**145,566**	**188,091**	**194,709**	**235,111**	**280,530**	**314,885**	**354,064**	**405,671**	**448,602**	**494,668**
% NOR	*15%*	*18%*	*17%*	*19%*	*20%*	*20%*	*21%*	*22%*	*22%*	*22%*

Source: OdontoPrev and own calculation.

Appendix 13 – Analyst Assumptions – Cost of Equity Calculation

DDM	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Discounted Div (R$ million)	262	259	284	282	286	281	271	257	236	222	209	197	185
Ke	*14.4%*	*14.2%*	*13.9%*	*13.7%*	*13.4%*	*13.4%*	*13.4%*	*13.4%*	*13.4%*	*13.4%*	*13.4%*	*13.4%*	*13.4%*
Beta	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Rf	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*
ERP	*6.4%*	*6.4%*	*6.4%*	*6.4%*	*6.4%*	*6.4%*	*6.4%*	*6.4%*	*6.4%*	*6.4%*	*6.4%*	*6.4%*	*6.4%*
Average Inflation Differential	*3.4%*	*3.2%*	*2.9%*	*2.7%*	*2.4%*	*2.4%*	*2.4%*	*2.4%*	*2.4%*	*2.4%*	*2.4%*	*2.4%*	*2.4%*
Country Risk Premium	*2.3%*	*2.3%*	*2.3%*	*2.3%*	*2.3%*	*2.3%*	*2.3%*	*2.3%*	*2.3%*	*2.3%*	*2.3%*	*2.3%*	*2.3%*

Source: Report Itaú BBA, 20th July 2015.

Appendix 14 – Valuation Consensus of the Investment Bank Analysts Covering the Company.

Investment Bank	Price (R$)	Date
Banco do Brasil	12.6	July 2015
Brasil Plural	8.5	July 2015
BTG Pactual	10.5	March 2015
Credit Suisse	11.0	July 2015
HSBC	11.0	August 2015
Itaú BBA	10.3	July 2015
JPMorgan	11.0	July 2015
J.Safra	10.0	July 2015
UBS	12.3	July 2015
Votorantim Corretora	10.9	July 2015
Average	10.8	July 2015

Source: OdontoPrev and own calculations.

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